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Sato et al.

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(54) **IMAGE FORMING APPARATUS**

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G03G 21/10 (2006.01)
G03G 15/16 (2006.01)

(52) **U.S. Cl.**
CPC ***G03G 21/12*** (2013.01); ***G03G 15/166*** (2013.01); ***G03G 21/105*** (2013.01); *G03G 2215/1652* (2013.01); *G03G 2215/1657* (2013.01); *G03G 2215/1661* (2013.01)

(58) **Field of Classification Search**
CPC G03G 21/10; G03G 21/105; G03G 21/12; G03G 2221/1684
See application file for complete search history.

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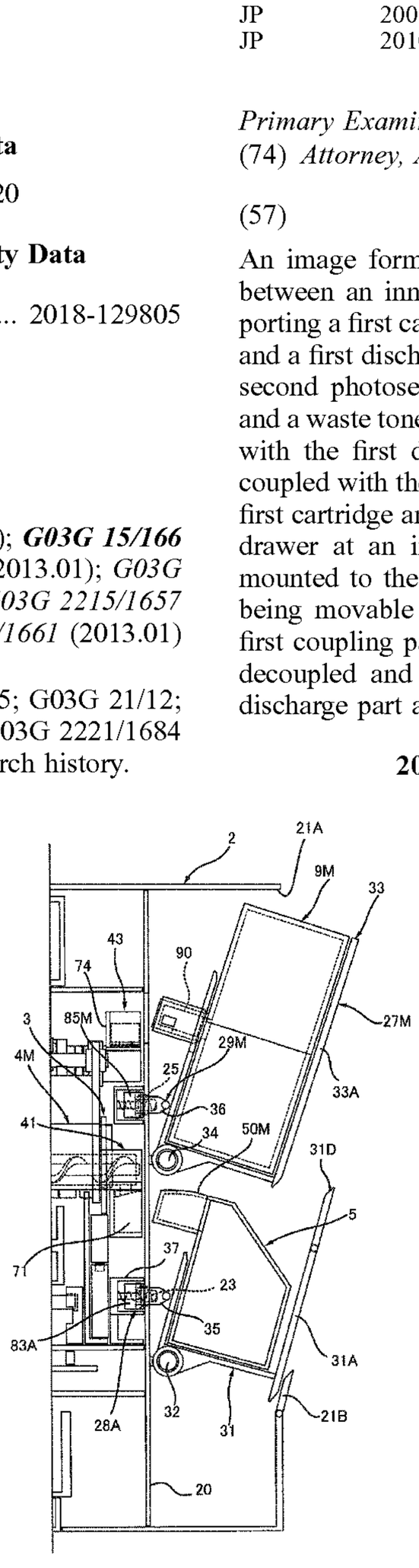
(57) **ABSTRACT**

An image forming apparatus includes: a drawer movable between an inner position and an outer position and supporting a first cartridge including a first photosensitive drum and a first discharge part and a second cartridge including a second photosensitive drum and a second discharge part; and a waste toner box including a first coupling part coupled with the first discharge part and a second coupling part coupled with the second discharge part, in a state where the first cartridge and the second cartridge are supported by the drawer at an inner position and the waste toner box is mounted to the apparatus main body, the waste toner box being movable between a first/second position where the first coupling part and the first discharge part are coupled/decoupled and the second coupling part and the second discharge part are coupled/decoupled.

20 Claims, 14 Drawing Sheets



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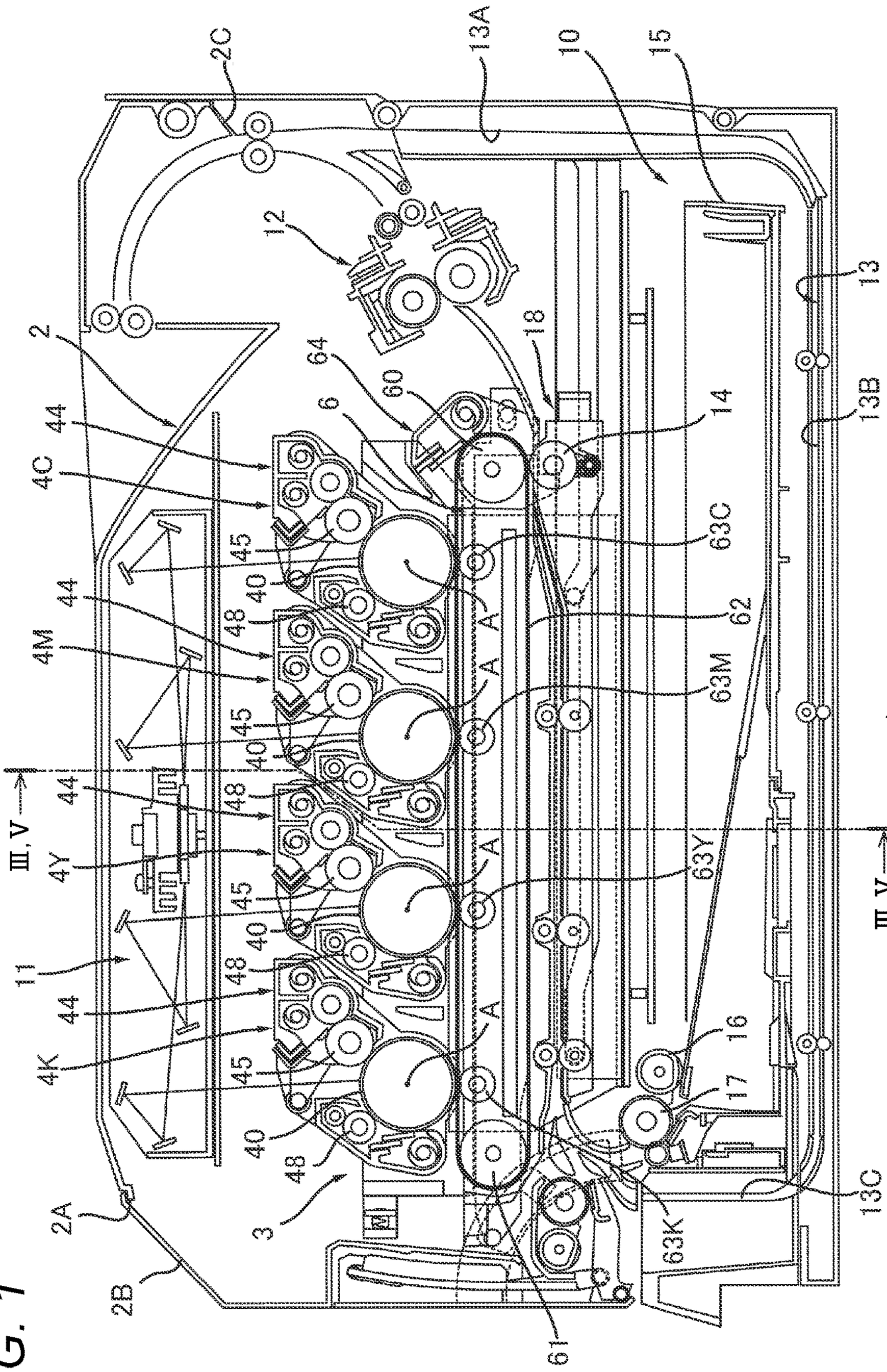
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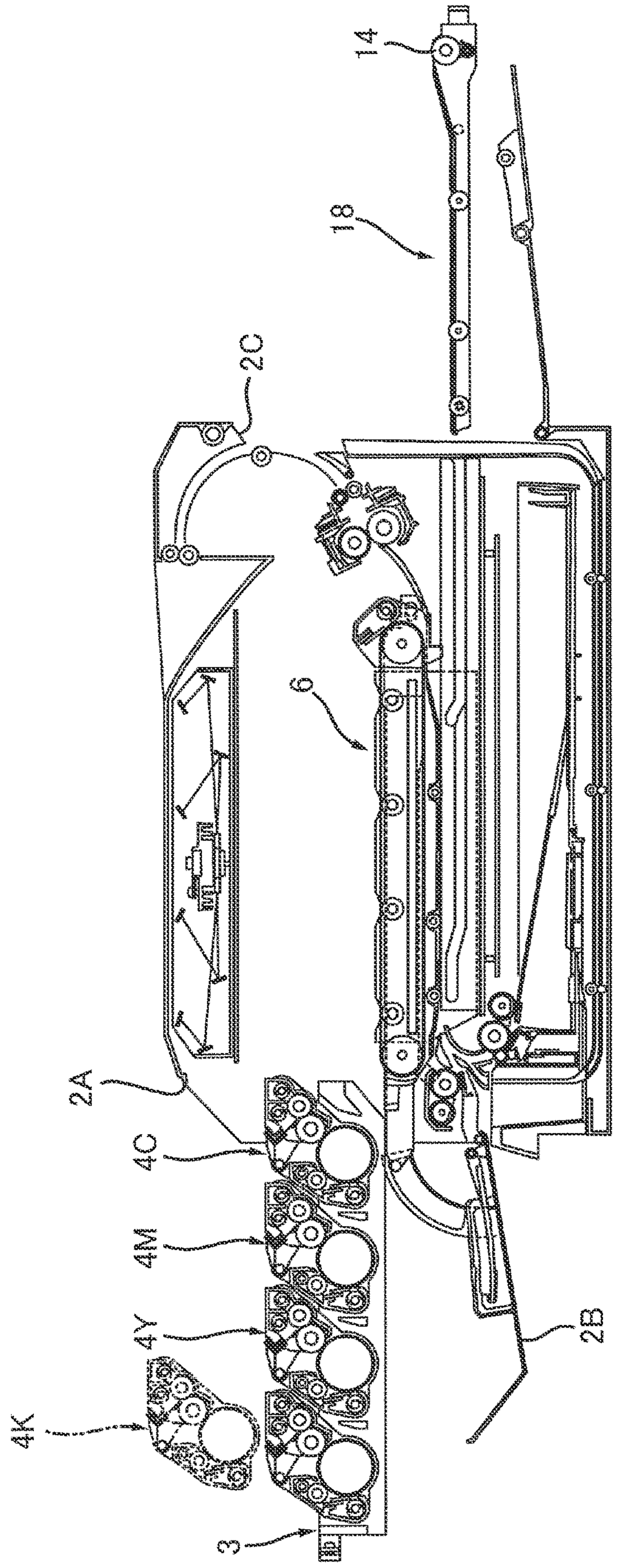
13A
10
15
12
13
2
64
18
H
60
6
14
13B
44
4C
45
40
48
4M
63C
62
63M
A
4Y
63Y
III, V
II, V
1
11
4K
16
17
2A
3
2B
63K
13C
61

FIG. 1

FIG. 2



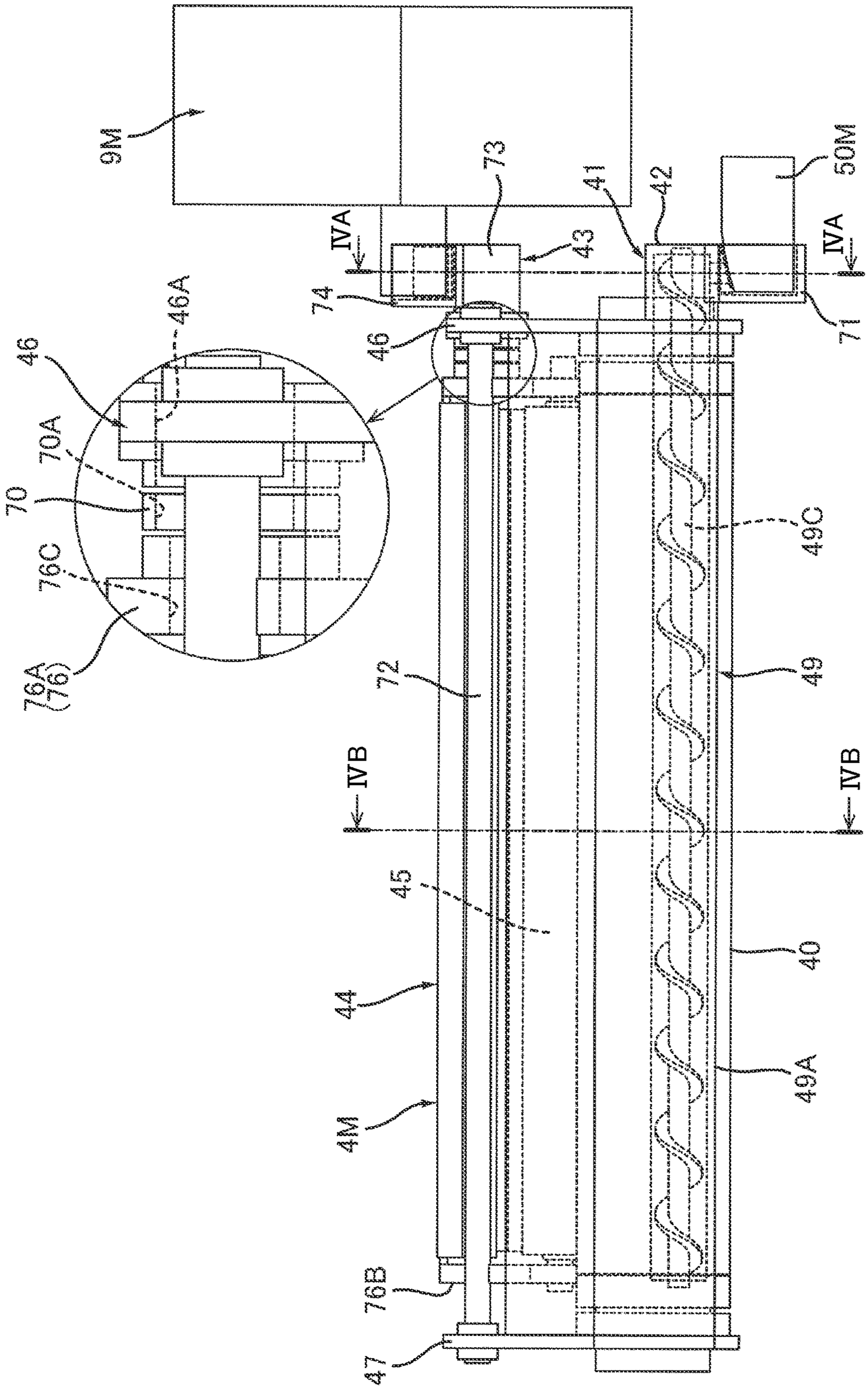

9M
73
41
42
50M
IVA
IVA
43
74
71
46A
46
46
70A
70
76C
76A
(76)
72
IVB
IVB
45
49C
49
40
44
4M
76B
47
49A

FIG. 3

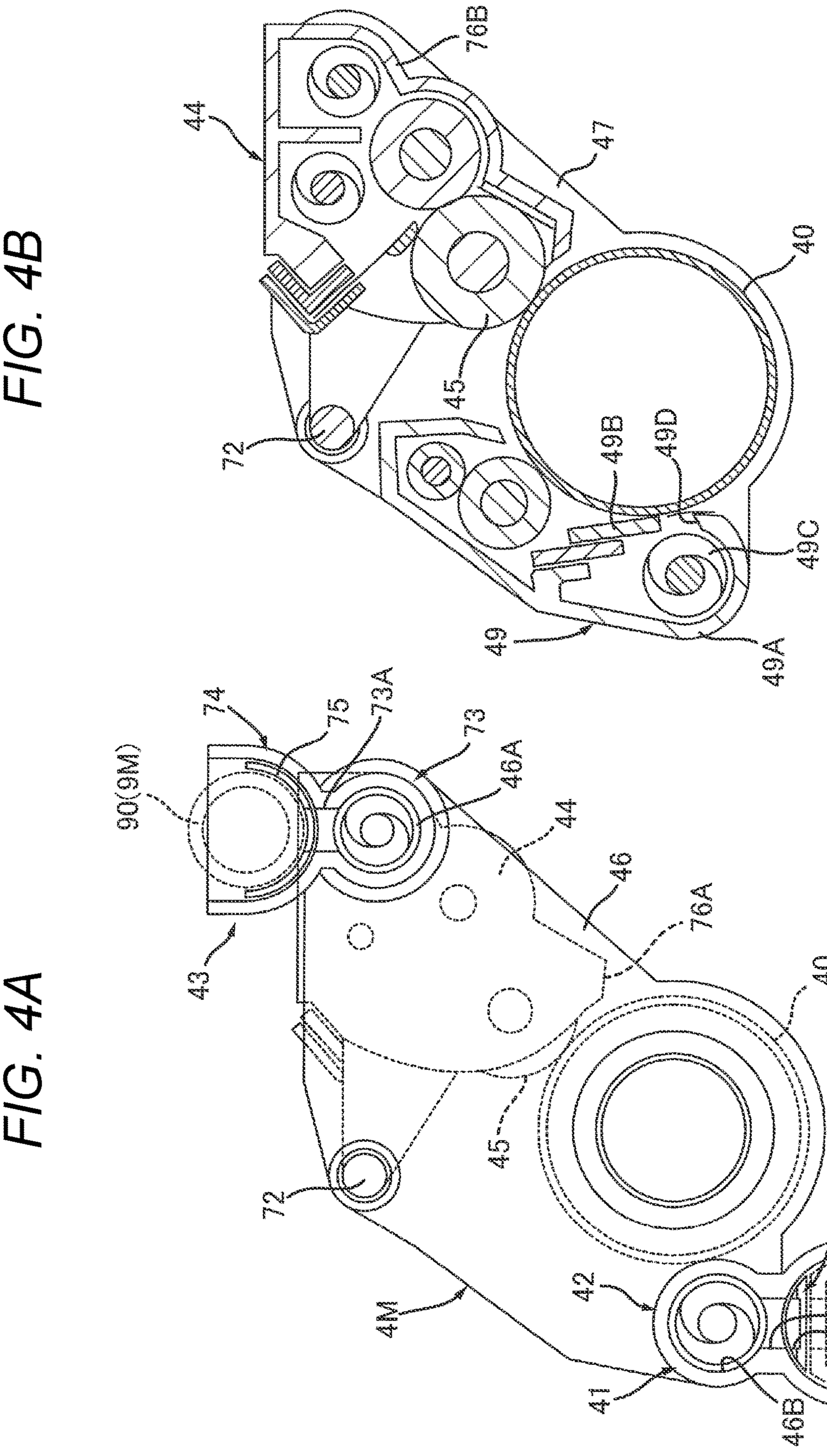

76B
44
47
40
45
72
49B
49D
49C
49
49A
74
75
73A
73
90(9M)
46A
44
46
76A
43
40
45
72
4M
42
24
71
42A
41
24A
46B

FIG. 4A

FIG. 4B

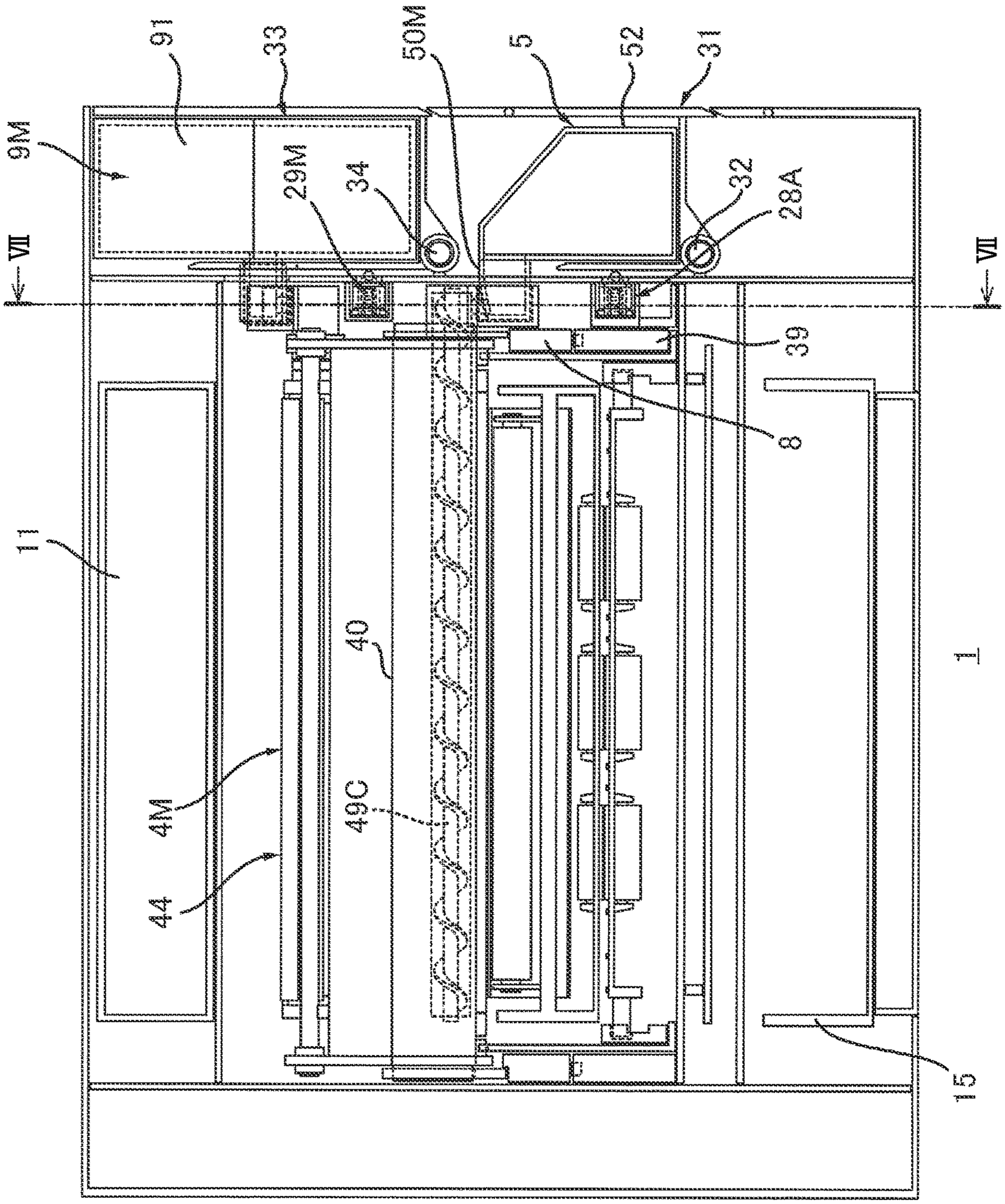
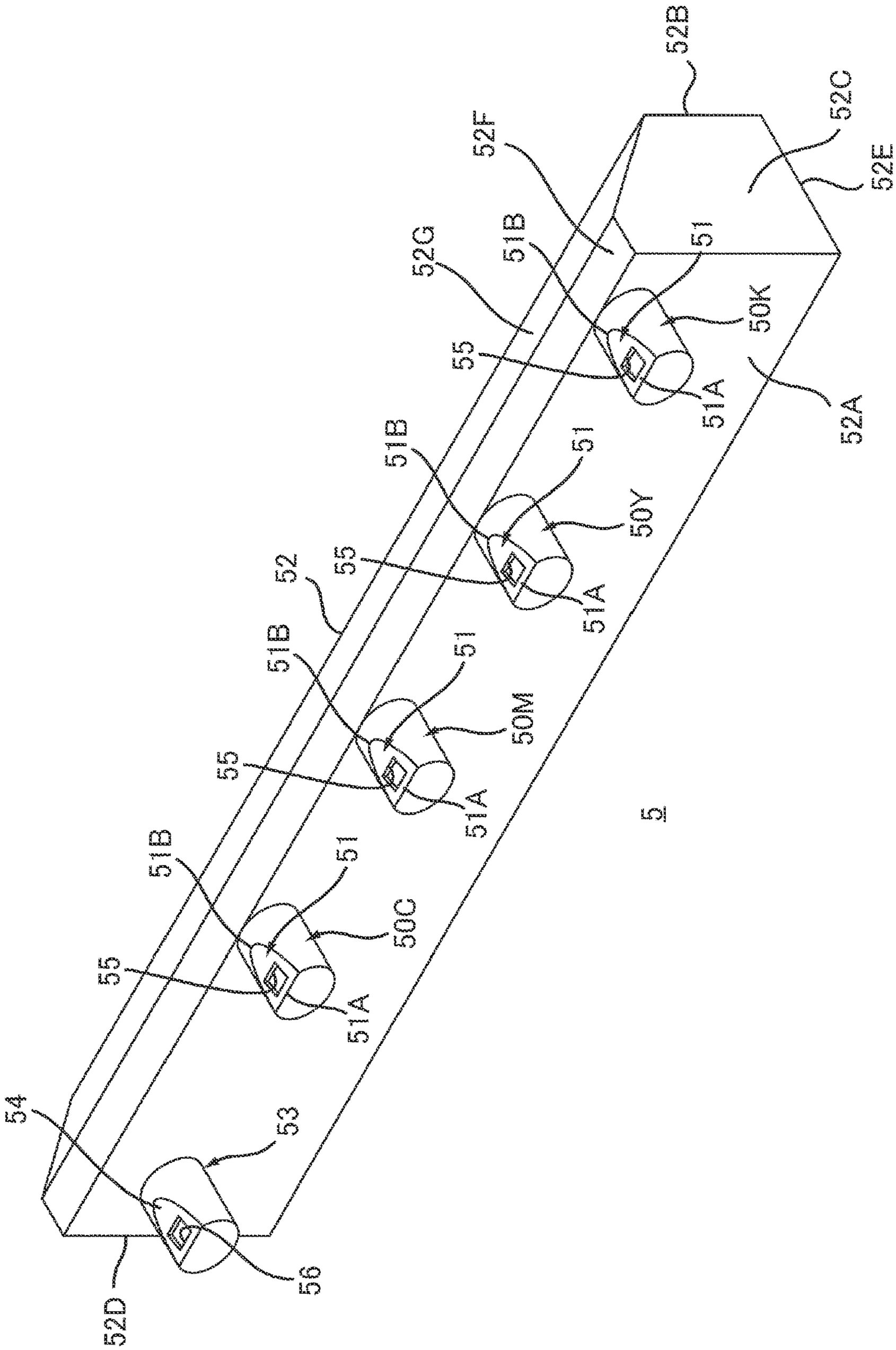


FIG. 5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52C
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52F
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51B
51
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51A
52A
51B
51
50Y
55
51A
52
51B
51
50M
55
51A
51B
51
50C
55
51A
54
53
56
52D
5

FIG. 6

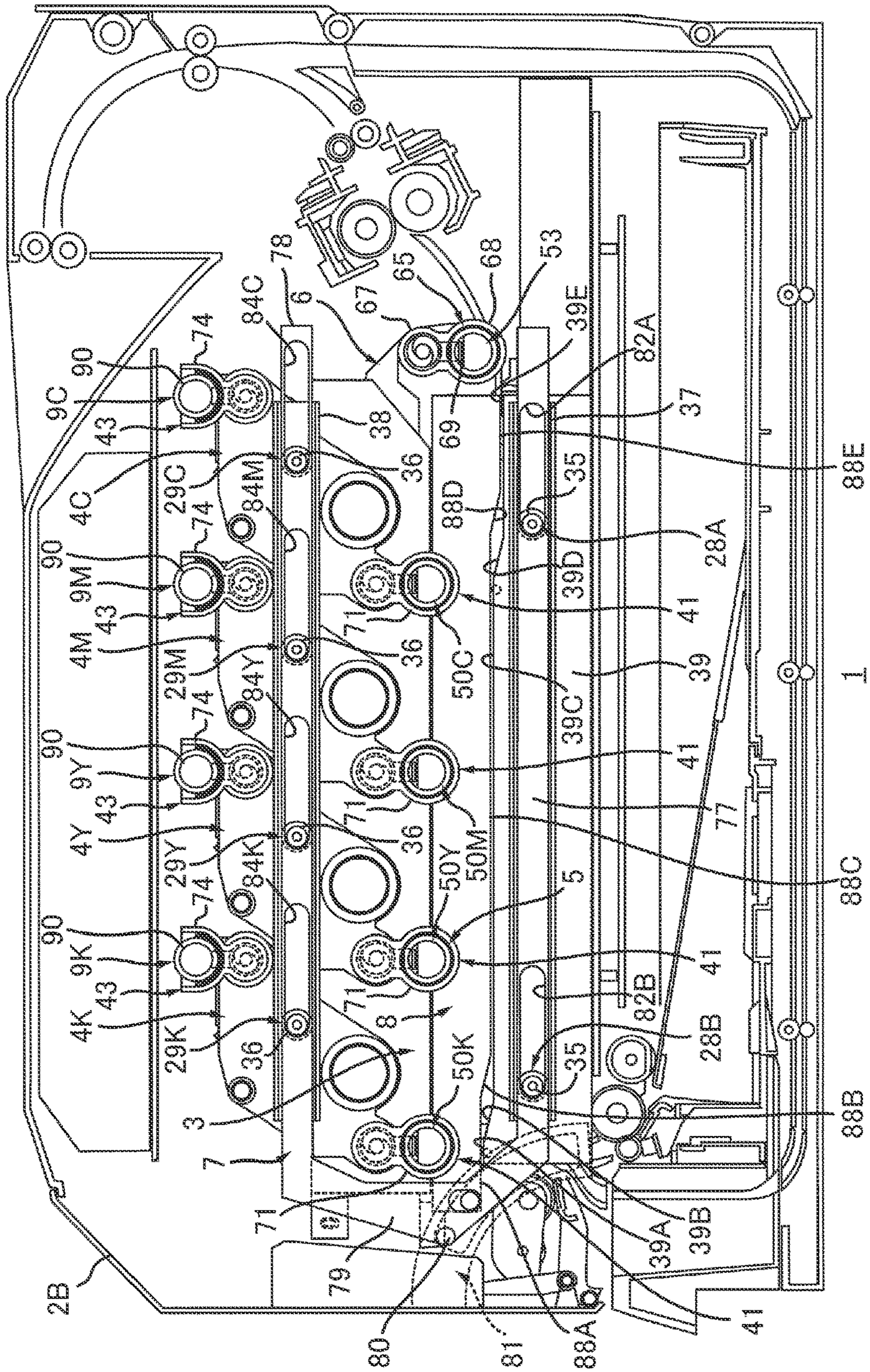
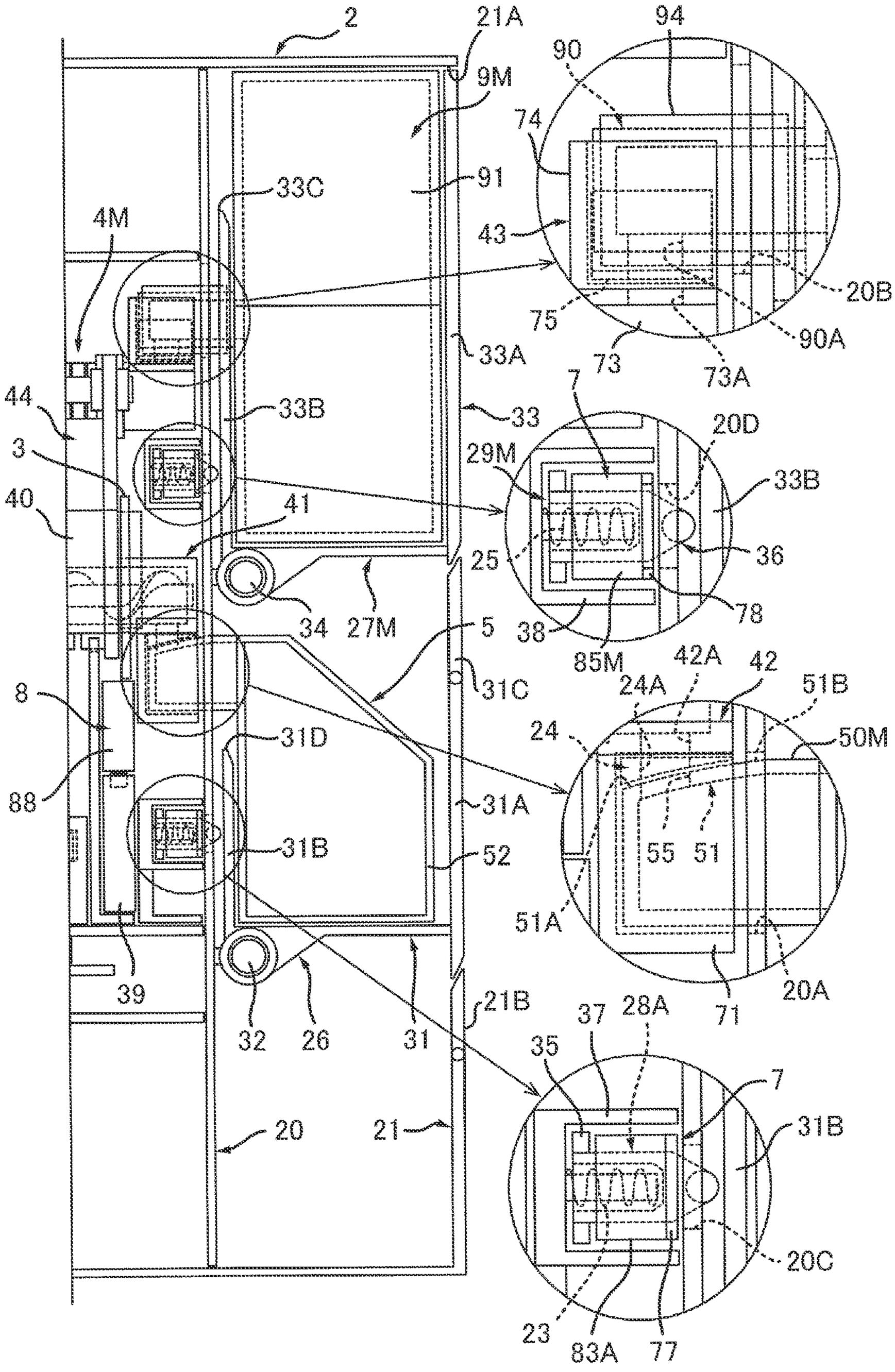

78
65
68
53
84C
6
67
74
39E
82A
37
9C
90
43
4C
29C
84M
38
69
88D
35
88E
4M
9M
29M
84Y
50C
39D
28A
41
4Y
9Y
29Y
84K
50Y
50M
39C
39
77
88C
1
4K
9K
29K
50K
82B
28B
88B
2B
79
80
81
88A
39A
39B

FIG. 7

FIG. 8


2
21A
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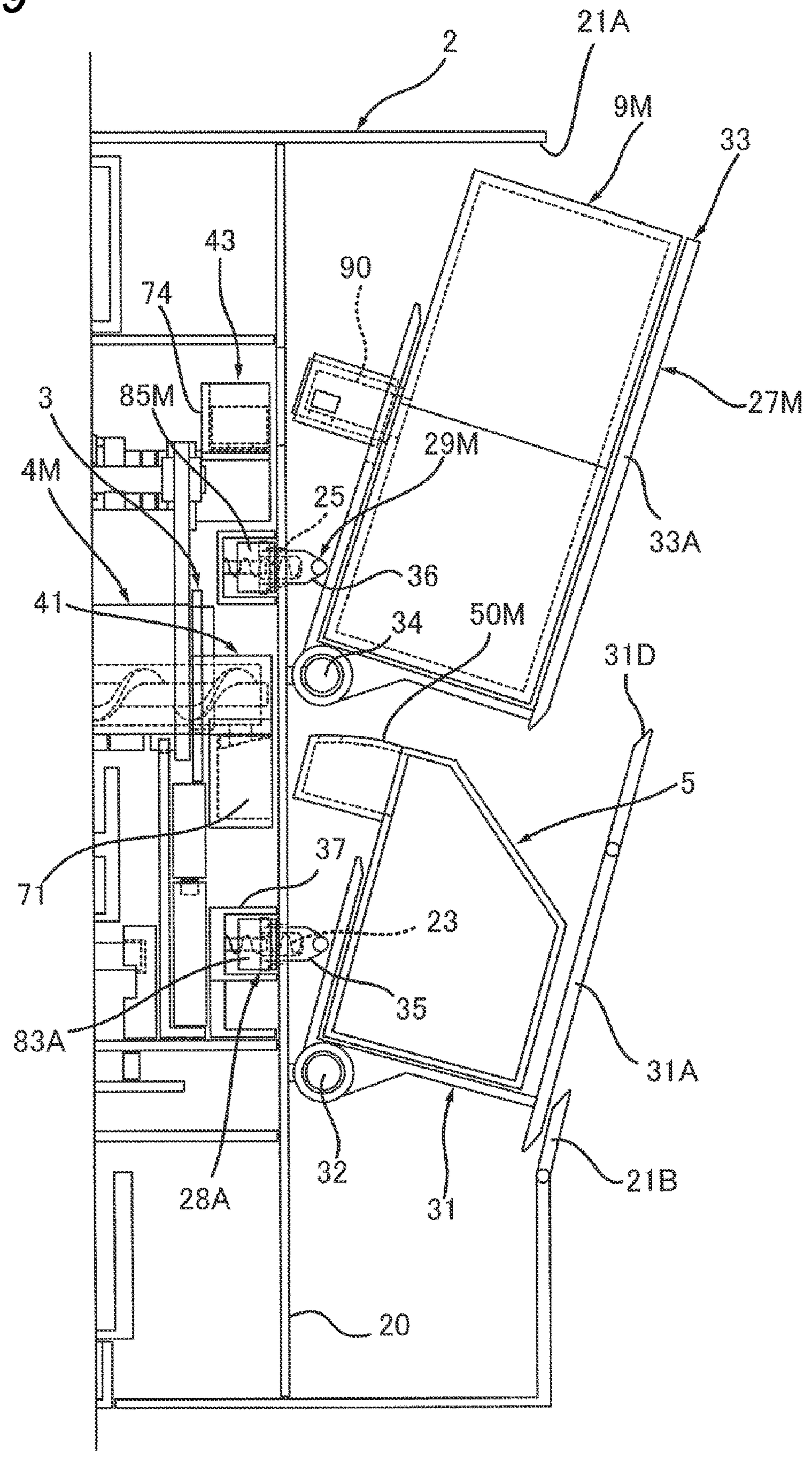
91
33C
4M
43
33A
44
33B
33
3
40
41
29M
25
34
27M
5
38
85M
42A
42
8
31C
24A
51B
24
50M
31D
88
31A
52
55
51
31B
51A
39
32
26
31
21B
37
28A
71
20A
35
7
20
21
31B
20C
23
83A
77
94
90
74
75
73
73A
90A
20B
20D
33B
36
78

FIG. 9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33
43
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74
3
85M
27M
29M
4M
25
33A
36
41
34
50M
31D
5
71
37
23
35
83A
31A
32
28A
31
21B
20

FIG. 10B

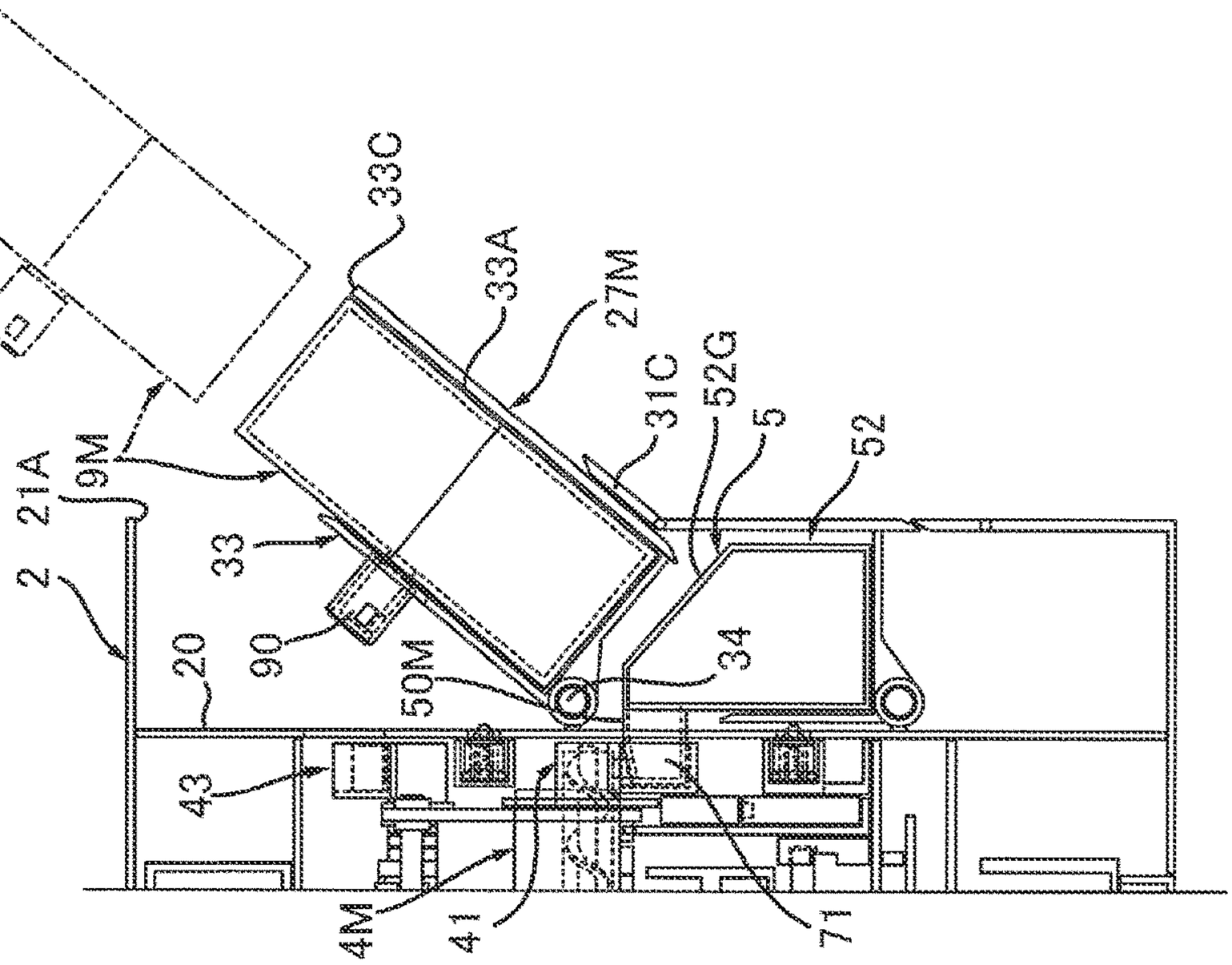
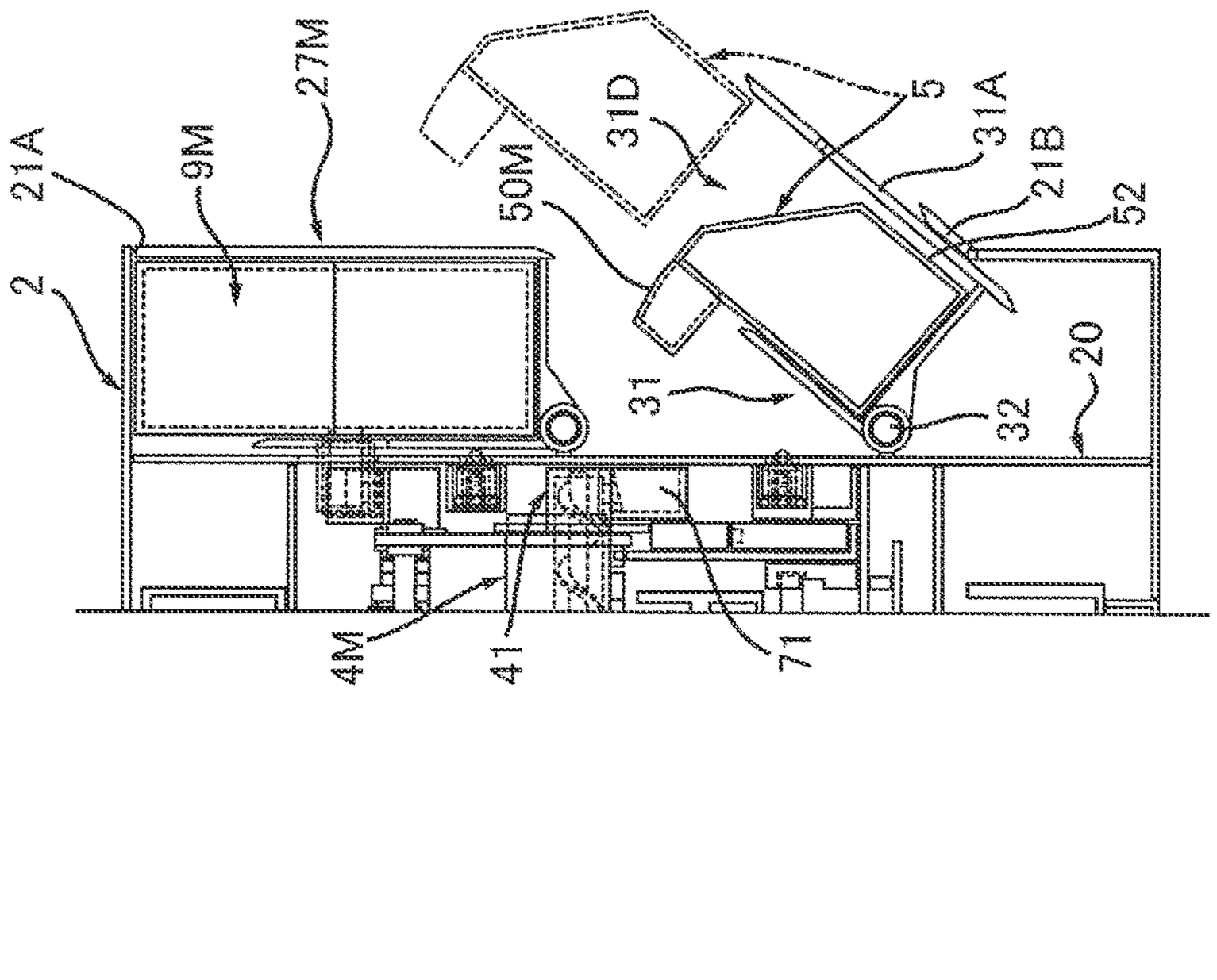


FIG. 10A



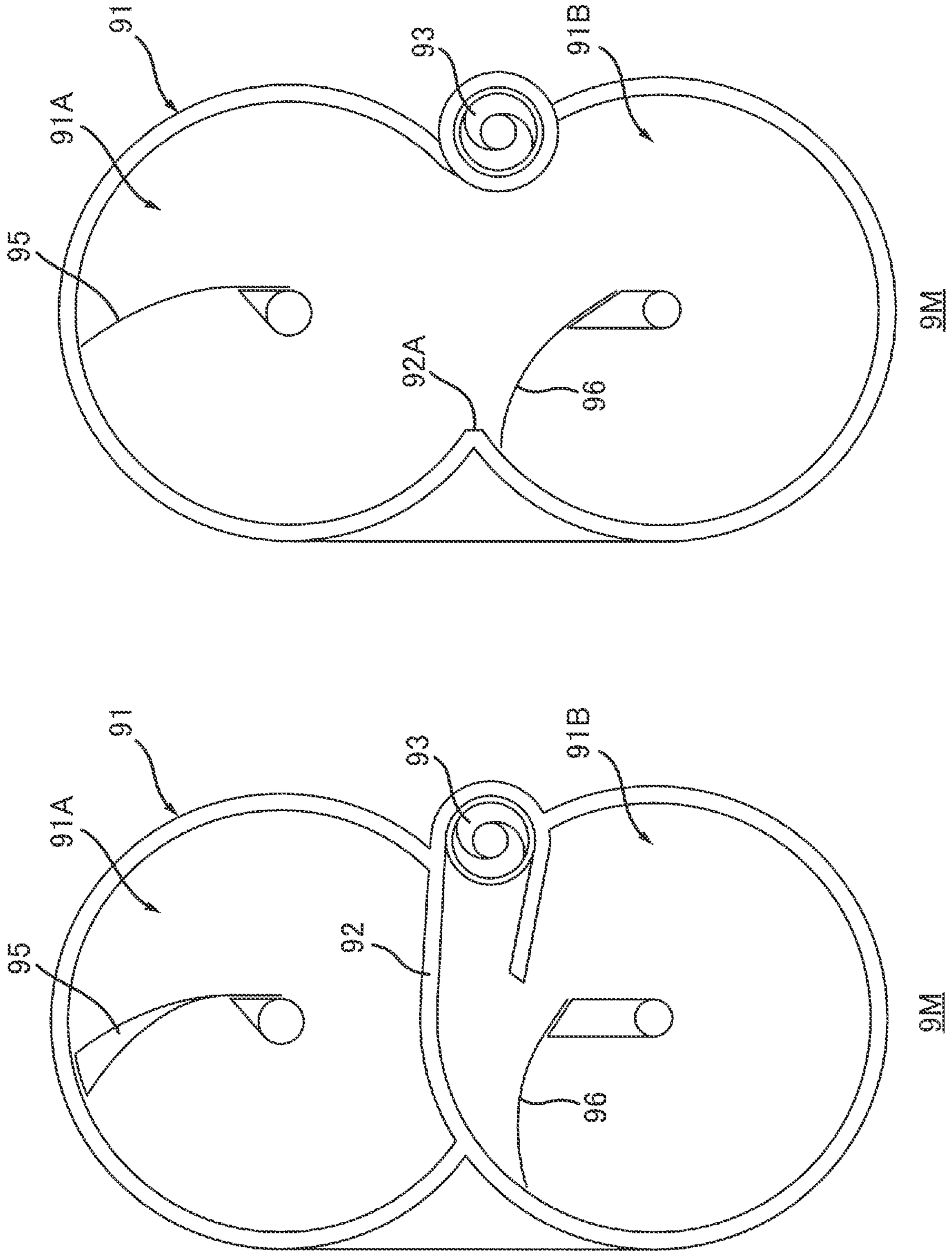
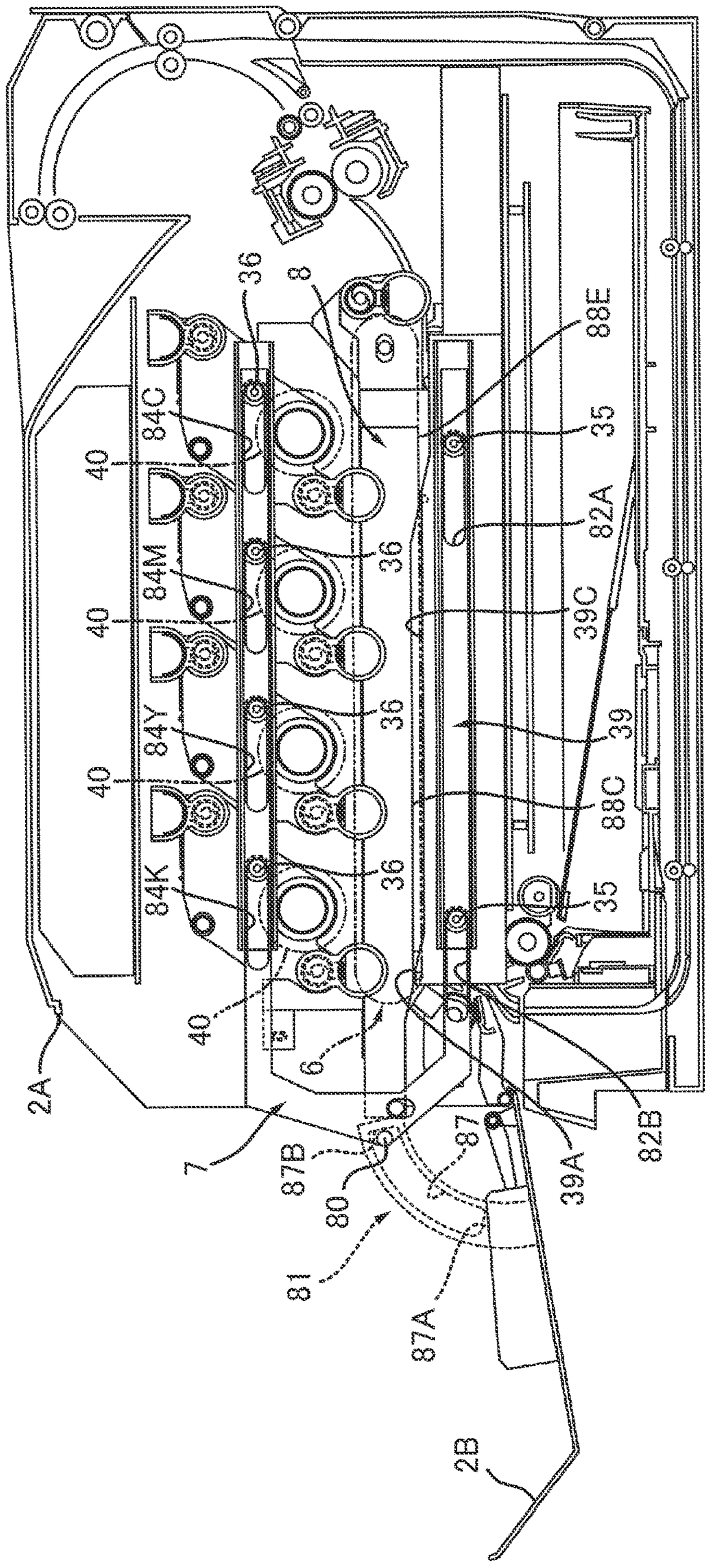


FIG. 11B

FIG. 11A

FIG. 12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8
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84C
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84Y
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82A
39C
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88C
2A
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87
80
81
87A
39A
82B
2B

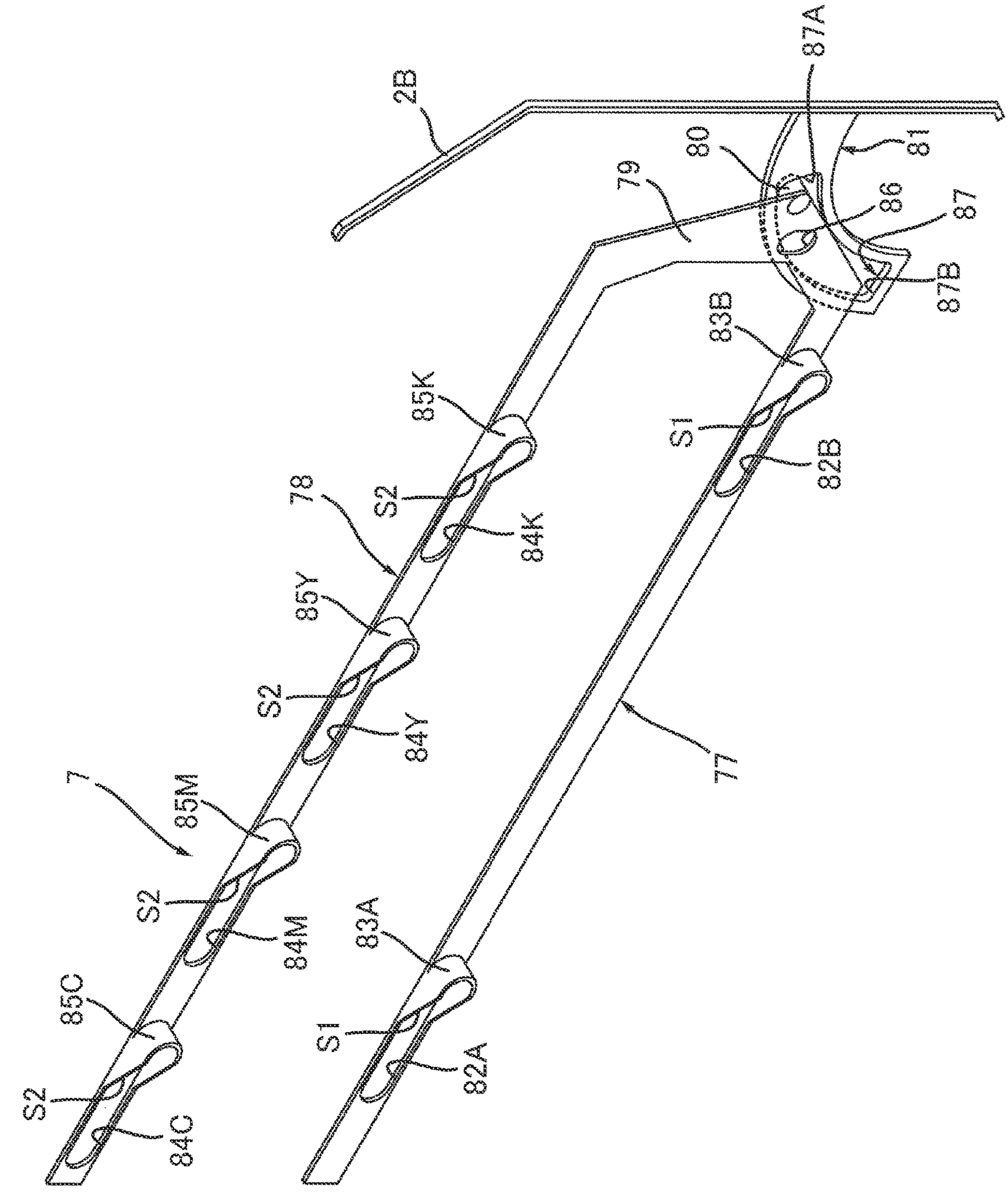
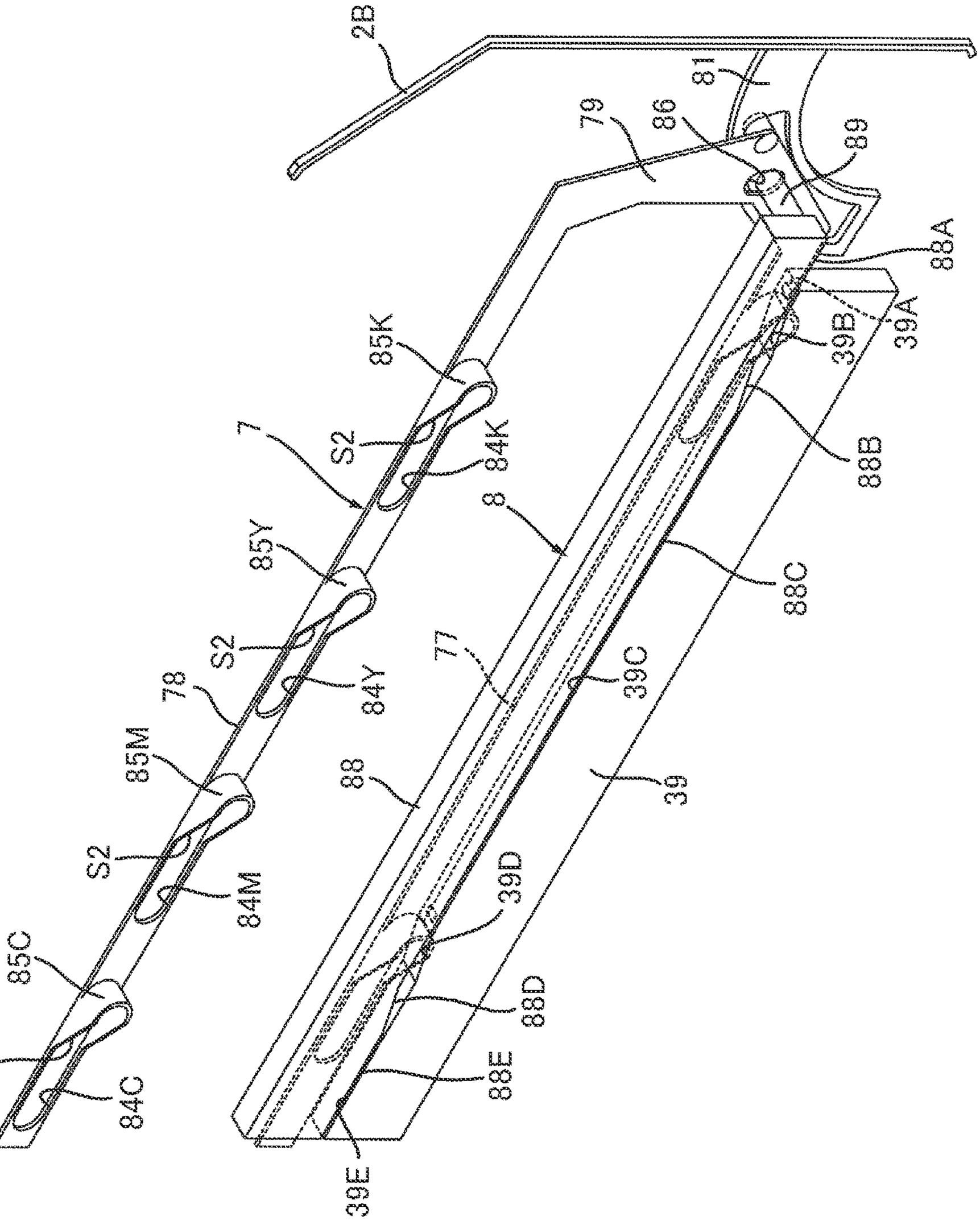

2B
87A
80
81
79
86
87
87B
83B
85K
78
S2
84K
85Y
S2
84Y
7
85M
S2
84M
83A
85C
S2
84C
S1
82B
77
S1
82A

FIG. 13


2B
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88A
85K
39B
39A
7
S2
84K
8
88B
85Y
88C
S2
78
84Y
77
39C
85M
88
39
S2
84M
39D
85C
88D
S2
84C
88E
39E

FIG. 14

IMAGE FORMING APPARATUS

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims priority from Japanese Patent Application No. 2018-129805 filed on Jul. 9, 2018, the entire subject-matter of which is incorporated herein by reference.

TECHNICAL FIELD

The disclosure relates to an image forming apparatus.

BACKGROUND

There has been proposed an image forming apparatus includes an apparatus main body, a drawer configured to be movable between an inner position located inside the apparatus main body and an outer position located outside the apparatus main body, a plurality of cartridges supported to the drawer, and a waste toner box. Each of the plurality of cartridges includes a photosensitive drum, and a drum cleaning unit configured to remove waste toner from the photosensitive drum. The drawer includes a collective conveying unit configured to collect the waste toner from the plurality of drum cleaning units and to convey the same to the waste toner box.

SUMMARY

Illustrative aspects of the disclosure provide an image forming apparatus capable of securing smooth movement of a drawer while accommodating waste toner from a plurality of photosensitive drums into a waste toner box.

One illustrative aspect of the disclosure may provide an image forming apparatus comprising: an apparatus main body having an opening; a drawer movable between: an inner position where the drawer is located inside the apparatus main body; and an outer position where the drawer is located outside the apparatus main body through the opening; a first cartridge supported by the drawer, the first cartridge comprising: a first photosensitive drum; and a first discharge part configured to discharge waste toner removed from the first photosensitive drum; a second cartridge supported by the drawer, the second cartridge comprising: a second photosensitive drum; and a second discharge part configured to discharge waste toner removed from the second photosensitive drum; and a waste toner box comprising: a first coupling part configured to be coupled with the first discharge part; and a second coupling part configured to be coupled with the second discharge part, in a state where the first cartridge and the second cartridge are supported by the drawer located at the inner position and the waste toner box is mounted to the apparatus main body, the waste toner box being movable between: a first position where the first coupling part and the first discharge part are coupled and the second coupling part and the second discharge part are coupled; and a second position where the first coupling part and the first discharge part are decoupled and the second coupling part and the second discharge part are decoupled.

According to the disclosure, in a state where the waste toner box is located at the first position, the first coupling part can receive the waste toner from the first discharge part, and the second coupling part can receive the waste toner from the second discharge part.

For this reason, even though the drawer does not include a member configured to collect the waste toner from the first discharge part and the second discharge part and to convey the same to the waste toner box, it is possible to accommodate the waste toner from the first photosensitive drum and the second photosensitive drum into the waste toner box. Also, in a state where the waste toner box is located at the second position, the first coupling part and the first discharge part are decoupled and the second coupling part and the second discharge part are decoupled. As a result, it is possible to secure smooth movement of the drawer while accommodating the waste toner from the first photosensitive drum and the second photosensitive drum into the waste toner box.

According to the disclosure, it is possible to secure smooth movement of the drawer while accommodating the waste toner from the plurality of photosensitive drums.

BRIEF DESCRIPTION OF DRAWINGS

Illustrative aspects of the invention will be described in detail with reference to the following figures wherein:

FIG. **1** is a schematic configuration view of an image forming apparatus;

FIG. **2** depicts a state where a drawer shown in FIG. **1** is located at an outer position;

FIG. **3** is a sectional view taken along a line of the image forming apparatus shown in FIG. **1**, depicting a cartridge;

FIG. **4**A is a sectional view taken along a line IVA-IVA of the cartridge shown in FIG. **3**, and FIG. **4**B is a sectional view taken along a line IVB-IVB of the cartridge shown in FIG. **3**;

FIG. **5** is a sectional view taken along a line V-V of the image forming apparatus shown in FIG. **1**;

FIG. **6** is a perspective view of a waste toner box shown in FIG. **5**;

FIG. **7** is a sectional view taken along a line D-D of the image forming apparatus shown in FIG. **1**;

FIG. **8** is an enlarged view of the image forming apparatus shown in FIG. **5**, depicting a state where the waste toner box is located at a first position and a toner box is located at a coupling position;

FIG. **9** depicts a state where the waste toner box shown in FIG. **8** is located at a second position and the toner box is located at a decoupling position;

FIG. **10**A depicts a state where the waste toner box shown in FIG. **9** is located at a third position and the toner box is located at the coupling position, and FIG. **10**B depicts a state where the waste toner box shown in FIG. **9** is located at the first position and the toner box is located at a separable position;

FIG. **11**A is a first schematic configuration view of the toner box shown in FIG. **8**, and FIG. **11**B is a second schematic configuration view of the toner box shown in FIG. **8**;

FIG. **12** depicts the image forming apparatus shown in FIG. **7**, in which a cover is located at an opening position;

FIG. **13** is a perspective view of a first link member shown in FIG. **7**; and

FIG. **14** is a perspective view of the first link member and a second link member shown in FIG. **7**.

DESCRIPTION OF EMBODIMENTS

In the related-art image forming apparatus, the collective conveying unit may be an obstacle to movement of the drawer.

Therefore, illustrative aspects of the disclosure provide an image forming apparatus capable of securing smooth movement of a drawer while accommodating waste toner from a plurality of photosensitive drums into a waste toner box.

1. Outline of Image Forming Apparatus **1**

An outline of an image forming apparatus **1** is described with reference to FIG. **1**.

The image forming apparatus **1** includes an apparatus main body **2**, a feeder unit **10**, a drawer **3**, a plurality of cartridges **4**K, **4**Y, **4**M, **4**C, an exposure device **11**, a belt unit (one example of a belt device) **6**, a secondary transfer roller **14**, a fixing device **12**, and a duplex printing path **13**.

1.1 Apparatus Main Body

The apparatus main body **2** is configured to accommodate therein the feeder unit **10**, the drawer **3**, the plurality of cartridges **4**K, **4**Y, **4**M, **4**C, the exposure device **11**, the belt unit **6**, the secondary transfer roller **14**, the fixing device **12**, and the duplex printing path **13**. The apparatus main body **2** has an opening **2**A and a cover **2**B.

The opening **2**A is located at an opposite side to the fixing device **12** with respect to the plurality of cartridges **4**K, **4**Y, **4**M, **4**C in a state where the drawer **3** is mounted to the apparatus main body **2**.

The cover **2**B is configured to be movable between a closing position (refer to FIG. **1**) at which the opening **2**A is closed and an opening position (refer to FIG. **2**) at which the opening **2**A is opened.

1.2 Feeder Unit

The feeder unit **10** is configured to feed a printing medium to the secondary transfer roller **14**. The printing medium is a printing sheet, for example. The feeder unit **10** includes a sheet feeding tray **15**, a pickup roller **16**, and a feeder roller **17**. The sheet feeding tray **15** is configured to accommodate therein the printing medium. The pickup roller **16** is configured to convey the printing medium in the sheet feeding tray **15** toward the feeder roller **17**. The feeder roller **17** is configured to convey the printing medium from the pickup roller **16** toward the secondary transfer roller **14**.

1.3 Drawer

The drawer **3** is configured to be movable between an inner position located inside the apparatus main body **2** (refer to FIG. **1**) and an outer position located outside the apparatus main body **2** (refer to FIG. **2**) through the opening **2**A, in a state where the cover **2**B is located at the opening position (refer to FIG. **2**). The drawer **3** is configured to support the plurality of cartridges **4**K, **4**Y, **4**M, **4**C. The drawer **3** is configured to be movable between the inner position and the outer position in an alignment direction (which will be described later), in a state where it supports the plurality of cartridges **4**K, **4**Y, **4**M, **4**C. In the meantime, the inner position is a position at which the drawer **3** is accommodated in the apparatus main body **2** and the plurality of cartridges **4**K, **4**Y, **4**M, **4**C cannot be mounted and demounted to and from the drawer **3**. The outer position is a position at which at least a part of the drawer **3** is located outside the apparatus main body **2** and at least one of the plurality of cartridges **4**K, **4**Y, **4**M, **4**C can be mounted and demounted to and from the drawer **3**. For this reason, even when a part of the drawer **3** is located inside the apparatus main body **2**, if at least one of the plurality of cartridges **4**K, **4**Y, **4**M, **4**C can be mounted and demounted to and from the drawer **3**, a position of the drawer **3** is included in the outer position.

1.4 Cartridge

The plurality of cartridges **4**K, **4**Y, **4**M, **4**C is supported to the drawer **3**. The plurality of cartridges **4**K, **4**Y, **4**M, **4**C is aligned with intervals. A direction in which the plurality of cartridges **4**K, **4**Y, **4**M, **4**C is aligned is defined as 'alignment direction'. The alignment direction intersects with an axis direction. Preferably, the alignment direction is perpendicular to in the axis direction. The axis direction will be described later. Each of the plurality of cartridges **4**K, **4**Y, **4**M, **4**C includes a photosensitive drum **40**, a charging roller **48**, and a developing unit (one example of a developing device) **44**.

The photosensitive drum **40** is configured to be rotatable about a rotational axis A. A direction in which the rotational axis A of the photosensitive drum **40** extends is defined as 'axis direction'. The axis direction intersects with both a vertical direction and the alignment direction. Preferably, the axis direction is perpendicular to both the vertical direction and the alignment direction. The photosensitive drum **40** extends in the axis direction, and has a cylindrical shape.

The charging roller **48** is configured to charge a peripheral surface of the photosensitive drum **40**. The charging roller **48** is in contact with the peripheral surface of the photosensitive drum **40**. In the meantime, the charging roller **48** may be replaced with a non-contact type charger such as a scorotron-type charger.

The developing unit **44** includes a developing roller **45**. The developing unit **44** is arranged so that the developing roller **45** is to face the photosensitive drum **40**. The developing roller **45** is configured to supply toner in the developing unit **44** to the photosensitive drum **40**. The developing roller **45** is in contact with the photosensitive drum **40**. The developing roller **45** is configured to develop a latent image formed on the photosensitive drum **40**, thereby forming a toner image on the peripheral surface of the photosensitive drum **40**.

1.5 Exposure Device

The exposure device **11** is configured to expose the photosensitive drum **40**, thereby forming a latent image. The exposure device **11** is configured to expose the peripheral surface of the photosensitive drum **40** charged by the charging roller **48**. Thereby, a latent image is formed on the peripheral surface of the photosensitive drum **40**. The exposure device **11** is located above the drawer **3** in a state where the drawer **3** is located at the inner position. The exposure device **11** is, specifically, a laser scan unit.

1.6 Belt Unit

The belt unit **6** is arranged to face the photosensitive drums **40** of the plurality of cartridges **4**K, **4**Y, **4**M, **4**C in the state where the drawer **3** is located at the inner position. The belt unit **6** is located between the drawer **3** and the sheet feeding tray **15** in the state where the drawer **3** is located at the inner position. The belt unit **6** includes a first roller **60**, a second roller **61**, an intermediate transfer belt **62**, a plurality of primary transfer rollers **63**K, **63**Y, **63**M, **63**C, and a belt cleaner **64**.

The first roller **60** is configured to be rotatable about a rotational axis extending in the axis direction. The second roller **61** is located with being spaced from the first roller **60** in the alignment direction. The second roller **61** is located at an opposite side to the fixing device **12** with respect to the first roller **60** in the alignment direction. The second roller **61** is configured to be rotatable about a rotational axis extending in the axis direction.

The intermediate transfer belt **62** is supported by the first roller **60** and the second roller **61**. The intermediate transfer belt **62** is an endless belt. The intermediate transfer belt **62**

is wound around the first roller **60** and the second roller **61**. The intermediate transfer belt **62** is configured to be movable around the first roller **60** and the second roller **61**. The intermediate transfer belt **62** is in contact with the photosensitive drum **40**, in the state where the drawer **3** is located at the inner position.

Each of the plurality of primary transfer rollers **63**K, **63**Y, **63**M, **63**C is configured to transfer the toner image from the photosensitive drum **40** to the intermediate transfer belt **62**. The plurality of primary transfer rollers **63**K, **63**Y, **63**M, **63**C is located between the first roller **60** and the second roller **61**. The plurality of primary transfer rollers **63**K, **63**Y, **63**M, **63**C is aligned in the alignment direction. The plurality of primary transfer rollers **63**K, **63**Y, **63**M, **63**C has the same structure, respectively. Each of the plurality of primary transfer rollers **63**K, **63**Y, **63**M, **63**C is located at an opposite side to the photosensitive drum **40** with respect to the intermediate transfer belt **62**.

The belt cleaner **64** is configured to clean the intermediate transfer belt **62**, thereby removing waste toner from a peripheral surface of the intermediate transfer belt **62**. The belt cleaner **64** is located between the first roller **60** and the fixing device **12**. The belt cleaner **64** is located at an opposite side to the first roller **60** with respect to the intermediate transfer belt **62**.

1.7 Secondary Transfer Roller

The secondary transfer roller **14** is configured to transfer the toner image from the intermediate transfer belt **62** to the printing medium. The secondary transfer roller **14** is located at an opposite side to the first roller **60** with respect to the intermediate transfer belt **62**. The intermediate transfer belt **62** passes between the secondary transfer roller **14** and the first roller **60** when it is moved. The secondary transfer roller **14** is provided for a secondary transfer unit **18**.

The secondary transfer unit **18** is located between the belt unit **6** and the sheet feeding tray **15**. The secondary transfer unit **18** can be demounted from the apparatus main body **2** through an opening **2**C of the apparatus main body **2** (refer to FIG. **2**). The opening **2**C is located at an opposite side to the opening **2**A with respect to the drawer **3** in the state where the drawer **3** is located at the inner position.

1.8 Fixing Device

The fixing device **12** is configured to heat and press the printing medium having the toner images transferred thereto, thereby fixing the toner images on the printing medium. The printing medium having passed through the fixing device **12** is discharged onto an upper surface of the apparatus main body **2**.

1.9 Duplex Printing Path

The duplex printing path **13** is formed to again convey the printing medium having passed through the fixing device **12** toward the secondary transfer roller **14**. The duplex printing path **13** includes a first path **13**A, a second path **13**B, and a third path **13**C.

The first path **13**A is located at an opposite side to the drawer **3** with respect to the fixing device **12** in the alignment direction, in the state where the drawer **3** is located at the inner position. The first path **13**A extends in the vertical direction.

The second path **13**B is a part between the first path **13**A and the third path **13**C of the duplex printing path **13**. The second path **13**B is located below the sheet feeding tray **15**. The second path **13**B extends in the alignment direction. The second path **13**B has one end and the other end in the alignment direction. One end of the second path **13**B continues to a lower end of the third path **13**C. The other end of the second path **13**B continues to a lower end of the first path **13**A.

The third path **13**C is located at an opposite side to the first path **13**A with respect to the feeder roller **17** in the alignment direction. The third path **13**C extends in the vertical direction. The third path **13**C is supported to the sheet feeding tray **15**.

2. Details of Cartridge

Subsequently, the plurality of cartridges **4**K, **4**Y, **4**M, **4**C is described in detail with reference to FIGS. **3**, **4**A and **4**B. In the meantime, the plurality of cartridges **4**K, **4**Y, **4**M, **4**C has the same structure. Therefore, in the below, the cartridge **4**M is described, and the descriptions of the cartridges **4**K, **4**Y, **4**C are omitted.

As shown in FIG. **3**, each of the plurality of cartridges **4**K, **4**Y, **4**M, **4**C further has a frame **46**, a frame **47**, a shaft **72**, an elastic member **70**, a receiving part **43**, a drum cleaner **49**, and a discharge part **41**.

2.1 Frame

The frame **46** is located at one end of the cartridge **4**M in the axis direction. The frame **47** is located at the other end of the cartridge **4**M in the axis direction. The frame **46** and the frame **47** are located with an interval in the axis direction. The frame **46** and the frame **47** extend in a direction intersecting with the axis direction, respectively. The frame **46** and the frame **47** are configured to rotatably support the photosensitive drum **40** and to swingably support the developing unit **44**. The frame **46** is configured to rotatably support one end of the photosensitive drum **40** in the axis direction. The frame **47** is configured to rotatably support the other end of the photosensitive drum **40** in the axis direction. The frame **46** is arranged to face the developing unit **44** in the axis direction in which the rotational axis A of the photosensitive drum **40** extends. The frame **47** is located at an opposite side to the frame **46** with respect to the developing unit **44**. The frame **46** and the frame **47** are configured to rotatably support the shaft **72**. The frame **46** and the frame **47** are configured to support the developing unit **44** via the shaft **72**.

2.2 Shaft

The shaft **72** is configured to support the developing unit **44** so that the developing roller **45** can move relative to the photosensitive drum **40**. The shaft **72** is located above the photosensitive drum **40** in a state where the cartridge **4**M is supported to the drawer **3**. The shaft **72** extends in the axis direction. The shaft **72** has one end and the other end in the axis direction. One end of the shaft **72** is rotatably supported to the frame **46**. The other end of the shaft **72** is rotatably supported to the frame **47**.

2.3 Developing Frame

The developing unit **44** further includes a developing frame **76**. The developing frame **76** is configured to support the developing roller **45**. The developing frame **76** is mounted to the shaft **72**. The developing frame **76** is located between the frame **46** and the frame **47** in the axis direction. The developing frame **76** extends in the axis direction. The developing frame **76** has one end **76**A and the other end **76**B in the axis direction. One end **76**A of the developing frame **76** is arranged to face the frame **46** with an interval in the axis direction. The other end **76**B of the developing frame **76** is located at an opposite side to the frame **46** with respect to one end **76**A.

2.4 Elastic Member

The elastic member **70** is arranged between the developing unit **44** and the frame **46** in the axis direction. For this reason, it is possible to suppress the toner from being leaked from between the developing unit **44** and the frame **46** while securing smooth swing of the developing unit **44**. The elastic member **70** is arranged between one end **76**A of the developing frame **76** and the frame **46** in the axis direction. The elastic member **70** may be formed of rubber, sponge or the like, for example. The elastic member **70** has a through-opening **70**A. The frame **46** has a first hole **46**A. The elastic member **70** is fixed to the frame **46** so that the through-opening **70**A is to communicate with the first hole **46**A in the axis direction. Also, one end **76**A of the developing frame **76** has a first communication hole **76**C. The first communication hole **76**C is formed to communicate with an internal space of the developing frame **76** and the through-opening **70**A in the axis direction. That is, the first hole **46**A, the through-opening **70**A and the first communication hole **76**C are formed to communicate with each other in the axis direction. Also, the first hole **46**A is formed to communicate with an internal space of the toner receiving wall **73**. For this reason, the internal space of the toner receiving wall **73** and the internal space of the developing frame **76** communicate with each other through the first hole **46**A, the through-opening **70**A and the first communication hole **76**C. The toner receiving wall **73** will be described later.

2.5 Receiving Part

As shown in FIG. **4**A, the receiving part **43** is configured to receive the toner from each of a plurality of toner boxes **9**K, **9**Y, **9**M, **9**C. In the meantime, the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C will be described later. The receiving part **43** has a toner receiving wall **73**, a toner coupling wall **74**, and a shutter **75**.

The toner receiving wall **73** is located at an opposite side to the developing unit **44** with respect to the frame **46**. The toner receiving wall **73** has a cylindrical shape. The toner receiving wall **73** extends in the axis direction. The toner receiving wall **73** has one end and the other end in the axis direction. One end of the toner receiving wall **73** is closed (refer to FIG. **3**). The other end of the toner receiving wall **73** is fixed to the frame **46** so that the internal space of the toner receiving wall **73** is to communicate with the first hole **46**A. The toner receiving wall **73** has a toner receiving opening **73**A. The toner is received into the toner receiving opening **73**A. The toner receiving opening **73**A is located at an upper end of the toner receiving wall **73** in the state where the cartridge **4**M is supported to the drawer **3**.

The toner coupling wall **74** is located above the toner receiving wall **73**, in the state where the cartridge **4**M is supported to the drawer **3**. The toner coupling wall **74** has a semi-cylindrical shape. The toner coupling wall **74** is opened upward, in the state where the cartridge **4**M is supported to the drawer **3**. The toner coupling wall **74** extends in the axis direction. The toner coupling wall **74** has one end and the other end in the axis direction. One end of the toner coupling wall **74** is opened (refer to FIG. **3**). The other end of the toner coupling wall **74** is closed. The toner coupling wall **74** is connected to the toner receiving wall **73** so that an internal space of the toner coupling wall **74** is to communicate with the toner receiving opening **73**A. Thereby, the internal space of the toner coupling wall **74** communicates with the internal space of the toner receiving wall **73** through the toner receiving opening **73**A.

The shutter **75** is arranged within the toner coupling wall **74**. The shutter **75** has a semi-circular arc shape conforming to an inner peripheral surface of the toner coupling wall **74**. The shutter **75** is configured to be movable between a closing position at which the toner receiving opening **73**A is closed and an opening position at which the toner receiving opening **73**A is opened.

2.6 Drum Cleaner

As shown in FIG. **4**B, the drum cleaner **49** is located at an opposite side to the developing unit **44** with respect to the photosensitive drum **40**. The drum cleaner **49** has a drum cleaner frame **49**A, a drum cleaning blade **49**B, and an auger **49**C.

The drum cleaner frame **49**A is configured to accommodate therein waste toner removed from the peripheral surface of the photosensitive drum **40** by the drum cleaning blade **49**B. The drum cleaner frame **49**A has an opening **49**D for receiving the waste toner. The drum cleaner frame **49**A is located between the frame **46** and the frame **47** in the axis direction. The drum cleaner frame **49**A extends in the axis direction.

The drum cleaning blade **49**B is configured to clean the photosensitive drum **40**, thereby removing the waste toner from the peripheral surface of the photosensitive drum **40**. An edge of the drum cleaning blade **49**B is located in the opening **49**D. The edge of the drum cleaning blade **49**B is in contact with the peripheral surface of the photosensitive drum **40**. Thereby, when the photosensitive drum **40** is rotated, the toner attached to the peripheral surface of the photosensitive drum **40** is scraped by the edge of the drum cleaning blade **49**B and is then accommodated in the drum cleaner frame **49**A through the opening **49**D.

The auger **49**C is configured to convey the waste toner in the drum cleaner frame **49**A toward the discharge part **41**. The auger **49**C is located in the drum cleaner frame **49**A. The auger **49**C extends in the axis direction.

2.7 Discharge Part

As shown in FIG. **4**A, the discharge part **41** is configured to discharge the waste toner removed from the photosensitive drum **40**. The discharge part **41** has a discharge wall **42**, a waste toner coupling wall **71**, and an elastic member **24**.

The discharge wall **42** is located at an opposite side to the drum cleaner frame **49**A with respect to the frame **46** (refer to FIG. **3**). The frame **46** has a second hole **46**B. The second hole **46**B is formed to communicate with an internal space of the drum cleaner frame **49**A in the axis direction. The discharge wall **42** has a cylindrical shape. The discharge wall **42** extends in the axis direction. The discharge wall **42** has one end and the other end in the axis direction. One end of the discharge wall **42** is closed (refer to FIG. **3**). The other end of the discharge wall **42** is fixed to the frame **46** so that an internal space of the discharge wall **42** is to communicate with the second hole **46**B. Thereby, the internal space of the drum cleaner frame **49**A and the internal space of the discharge wall **42** communicate with each other through the second hole **46**B, in the axis direction. The discharge wall **42** has a discharge opening **42**A. The waste toner is to pass through the discharge opening **42**A. The discharge opening **42**A is located at a lower end of the discharge wall **42**, in the state where the cartridge **4**M is supported to the drawer **3**.

The waste toner coupling wall **71** is located below the discharge wall **42** in the state where the cartridge **4**M is supported to the drawer **3**. The waste toner coupling wall **71** extends in the axis direction. The waste toner coupling wall **71** has one end and the other end in the axis direction. One end of the waste toner coupling wall **71** is opened. The other end of the waste toner coupling wall **71** is closed (refer to FIG. **3**). The waste toner coupling wall **71** is connected to the discharge wall **42** so that an internal space of the waste toner coupling wall **71** is to communicate with the discharge

opening **42**A. Thereby, the internal space of the waste toner coupling wall **71** communicates with the internal space of the discharge wall **42**, through the discharge opening **42**A.

The elastic member **24** is located within the waste toner coupling wall **71**. The elastic member **24** has a communication opening **24**A. The elastic member **24** is fixed to an inner peripheral surface of the waste toner coupling wall **71** so that the communication opening **24**A is to communicate with the discharge opening **42**A. The elastic member **24** may be formed of rubber, sponge or the like, for example.

3. Details of Image Forming Apparatus

As shown in FIG. **5**, the image forming apparatus **1** further includes a waste toner box **5**, and a plurality of toner boxes **9**K, **9**Y, **9**M, **9**C (refer to FIG. **7**).

3.1 Waste Toner Box

As shown in FIG. **6**, the waste toner box **5** has a box main body **52**, a plurality of coupling parts **50**K, **50**Y, **50**M, **50**C, and a sub-coupling part **53**.

3.1.1 Box Main Body

The box main body **52** can accommodate therein the waste toner removed from the photosensitive drum **40** and the waste toner removed from the intermediate transfer belt **62** (refer to FIG. **1**). The box main body **52** extends in the alignment direction. The box main body **52** has a first wall **52**A, a second wall **52**B, a first sidewall **52**C, a second sidewall **52**D, a bottom wall **52**E, an upper wall **52**F, and an inclined wall **52**G. In the meantime, the configuration of the box main body **52** is described on the basis of a state where the waste toner box **5** is located at a first position, which will be described later.

The first wall **52**A is configured to support the plurality of coupling parts **50**K, **50**Y, **50**M, **50**C. The second wall **52**B is located at an opposite side to the plurality of coupling parts **50**K, **50**Y, **50**M, **50**C with respect to the first wall **52**A. The second wall **52**B is located with being spaced from the first wall **52**A in the axis direction.

The first sidewall **52**C and the second sidewall **52**D are located at both end portions of the box main body **52** in the alignment direction, and are spaced from each other in the alignment direction. The bottom wall **52**E is located at a lower end portion of the box main body **52**.

The upper wall **52**F is arranged with being spaced from the bottom wall **52**E in the vertical direction, and extends in parallel with the bottom wall **52**E. The upper wall **52**F has one end and the other end in the axis direction. One end of the upper wall **52**F in the axis direction is located with being spaced from an upper end of the second wall **52**B. One end of the upper wall **52**F in the axis direction is located above the upper end of the second wall **52**B. The other end of the upper wall **52**F in the axis direction is connected to an upper end of the first wall **52**A.

The inclined wall **52**G is formed to interconnect one end of the upper wall **52**F in the axis direction and the upper end of the second wall **52**B. The inclined wall **52**G intersects with both the vertical direction and the axis direction. The inclined wall **52**G is inclined toward the bottom wall **52**E from the upper wall **52**F toward the second wall **52**B. Since the inclined wall **52**G is inclined, when mounting and demounting the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C to and from the apparatus main body **2**, it is possible to suppress the waste toner box **5** from being an obstacle (refer to FIG. **10**B).

3.1.2 Coupling Part

The plurality of coupling parts **50**K, **50**Y, **50**M, **50**C can be coupled with the discharge parts **41** of the plurality of cartridges **4**K, **4**Y, **4**M, **4**C (refer to FIG. **7**). Specifically, the coupling part **50**K can be coupled with the discharge part **41** of the cartridge **4**K. The coupling part **50**Y can be coupled with the discharge part **41** of the cartridge **4**Y. The coupling part **50**M can be coupled with the discharge part **41** of the cartridge **4**M. The coupling part **50**C can be coupled with the discharge part **41** of the cartridge **4**C.

The plurality of coupling parts **50**K, **50**Y, **50**M, **50**C is located on an outer surface of the box main body **52** in the axis direction. The plurality of coupling parts **50**K, **50**Y, **50**M, **50**C protrudes from the first wall **52**A. The plurality of coupling parts **50**K, **50**Y, **50**M, **50**C is arranged with intervals in the alignment direction. The plurality of coupling parts **50**K, **50**Y, **50**M, **50**C has the same structure, respectively. Therefore, the coupling part **50**M is described, and the descriptions of the coupling parts **50**K, **50**Y, **50**C are omitted.

The coupling part **50**M has a cylindrical shape. The coupling part **50**M extends in the axis direction. The coupling part **50**M has one end and the other end in the axis direction. One end of the coupling part **50**M is fixed to the box main body **52**. The other end of the coupling part **50**M is closed. An internal space of the coupling part **50**M is formed to communicate with an internal space of the box main body **52**. The coupling part **50**M has a receiving wall **51**. That is, the plurality of coupling parts **50**K, **50**Y, **50**M, **50**C has a receiving wall **51**, respectively. The receiving wall **51** is located at an upper end of the coupling part **50**M in the state where the waste toner box **5** is located at a first position. The first position of the waste toner box **5** will be described later. The receiving wall **51** has a receiving opening **55**. The waste toner from the discharge opening **42**A is received through the receiving opening **55**.

3.1.3 Sub-Coupling Part

The sub-coupling part **53** is located on an outer surface of the box main body **52** in the axis direction. The sub-coupling part **53** protrudes from the first wall **52**A. The sub-coupling part **53** is arranged with being spaced from the coupling part **50**C in the alignment direction. The sub-coupling part **53** has the same structure as the coupling part **50**M. Therefore, the detailed description of the sub-coupling part **53** is omitted. In the meantime, a receiving wall of the sub-coupling part **53** is described as a receiving wall **54**, and a receiving opening of the sub-coupling part **53** is described as a receiving opening **56**.

Also, as shown in FIG. **7**, the sub-coupling part **53** can be coupled with a sub-discharge part **65** of the belt unit **6**. The sub-discharge part **65** is configured to discharge the waste toner removed from the intermediate transfer belt **62** (refer to FIG. **1**) by the belt cleaner **64** (refer to FIG. **1**). The sub-discharge part **65** has the same configuration as the discharge part **41**. Therefore, the detailed description of the sub-discharge part **65** is omitted. In the meantime, a discharge wall of the sub-discharge part **65** is described as a discharge wall **67**, a waste toner coupling wall of the sub-discharge part **65** is described as a waste toner coupling wall **68**, and an elastic member of the sub-discharge part **65** is described as an elastic member **69**.

3.1.4 First Position of Waste Toner Box

The waste toner box **5** is configured to be movable between a first position (refer to FIG. **8**) and a second position (refer to FIG. **9**) in a state where the waste toner box is mounted to the apparatus main body **2**. In the exemplary embodiment, the waste toner box **5** is configured to be rotatable among the first position (refer to FIG. **8**), the second position (refer to FIG. **9**), and a third position (refer to FIG. **10**A) in the state where the waste toner box is

mounted to the apparatus main body **2**. For this reason, it is possible to smoothly move the waste toner box **5** to the first position, the second position and the third position.

As shown in FIG. **8**, in a state where the plurality of cartridges **4**K, **4**Y, **4**M, **4**C is supported to the drawer **3** located at the inner position and the waste toner box **5** is located at the first position, the waste toner box **5** is arranged in alignment with the plurality of cartridges **4**K, **4**Y, **4**M, **4**C in the axis direction in which the rotational axis A of the photosensitive drum **40** extends (refer to FIG. **1**). In the state where the plurality of cartridges **4**K, **4**Y, **4**M, **4**C is supported to the drawer **3** located at the inner position and the waste toner box **5** is located at the first position, the plurality of coupling parts **50**K, **50**Y, **50**M, **50**C and the discharge parts **41** of the plurality of cartridges **4**K, **4**Y, **4**M, **4**C are coupled with each other (refer to FIG. **7**). Specifically, the coupling part **50**K is coupled with the discharge part **41** of the cartridge **4**K, the coupling part **50**Y is coupled with the discharge part **41** of the cartridge **4**Y, the coupling part **50**M is coupled with the discharge part **41** of the cartridge **4**M, and the coupling part **50**C is coupled with the discharge part **41** of the cartridge **4**C. More specifically, each of the plurality of coupling parts **50**K, **50**Y, **50**M, **50**C is fitted to the waste toner coupling wall **71** (refer to FIG. **7**). The receiving wall **51** faces the discharge wall **42** in the state where the waste toner box **5** is located at the first position. The receiving wall **51** has a first end portion **51**A and a second end portion **51**B in a direction facing from the waste toner box **5** toward the plurality of cartridges **4**K, **4**Y, **4**M, **4**C. The second end portions **51**B are located at an opposite side to the plurality of cartridges **4**K, **4**Y, **4**M, **4**C with respect to the first end portions **51**A, in the state where the waste toner box **5** is located at the first position. The receiving wall **51** is inclined so as to be distant from the discharge wall **42** from the second end portion **51**B toward the first end portion **51**A in the state where the waste toner box **5** is located at the first position. For this reason, when the waste toner box **5** is moved from the second position (refer to FIG. **9**) to the first position, it is possible to suppress the receiving wall **51** from contacting the discharge wall **42** and to stably arrange the receiving wall **51** so as to face the discharge wall **42**.

Also, the elastic member **24** is arranged between the discharge wall **42** and the receiving wall **51** in the state where the waste toner box **5** is located at the first position. The communication opening **24**A communicates with each of the discharge opening **42**A and the receiving opening **55**. For this reason, in the state where the waste toner box **5** is located at the first position, the elastic member **24** can stably fill a gap between the discharge wall **42** and the receiving wall **51**. The waste toner that is discharged from the discharge opening **42**A is received into the receiving opening **55** through the communication opening **24**A. As a result, it is possible to prevent the waste toner from being leaked from between the discharge wall **42** and the receiving wall **51**.

Also, the sub-coupling part **53** is fitted to the waste toner coupling wall **68** in the state where the waste toner box **5** is located at the first position (refer to FIG. **7**).

3.1.5 Second Position of Waste Toner Box

As shown in FIG. **9**, in a state where the plurality of cartridges **4**K, **4**Y, **4**M, **4**C is supported to the drawer **3** located at the inner position and the waste toner box **5** is located at the second position, the waste toner box **5** is located more distant from the plurality of cartridges **4**K, **4**Y, **4**M, **4**C, as compared to the case where the waste toner box **5** is located at the first position (refer to FIG. **1**). Specifically, in a state where the waste toner box **5** is accommodated in a first accommodation frame **31** (which will be described later), the waste toner box is rotated about a rotary shaft **32** (which will be described later), which is a support point, and is tilted so as to be distant from the first wall **20**. In the state where the plurality of cartridges **4**K, **4**Y, **4**M, **4**C is supported to the drawer **3** located at the inner position and the waste toner box **5** is located at the second position, the plurality of coupling parts **50**K, **50**Y, **50**M, **50**C and the discharge parts **41** of the plurality of cartridges **4**K, **4**Y, **4**M, **4**C are decoupled. Specifically, the coupling part **50**K and the discharge part **41** of the cartridge **4**K are decoupled, the coupling part **50**Y and the discharge part **41** of the cartridge **4**Y are decoupled, the coupling part **50**M and the discharge part **41** of the cartridge **4**M are decoupled, and the coupling part **50**C and the discharge part **41** of the cartridge **4**C are decoupled. More specifically, each of the plurality of coupling parts **50**K, **50**Y, **50**M, **50**C is separated from the waste toner coupling wall **71**, and is located with being spaced from each of the discharge parts **41** of the plurality of cartridges **4**K, **4**Y, **4**M, **4**C in the axis direction.

In the meantime, in the state where the waste toner box **5** is located at the second position, the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C mounted to the apparatus main body **2** is located downstream of the waste toner box **5** located at the second position with respect to a separation direction of the waste toner box **5** from the apparatus main body **2**. For this reason, in the state where the waste toner box **5** is located at the second position, the waste toner box **5** cannot be separated from the apparatus main body **2**.

3.1.6 Third Position of Waste Toner Box

As shown in FIG. **10**A, in a state where the waste toner box **5** is located at the third position, the waste toner box **5** is located more distant from the first position than the second position. In the state where the waste toner box **5** is located at the third position, a distance between each of the plurality of coupling parts **50**K, **50**Y, **50**M, **50**C and each of the plurality of discharge part **41** is greater than a distance in the state where the waste toner box **5** is located at the second position. Specifically, when the waste toner box **5** is moved from the second position to the third position, a first accommodation frame **31** (which will be described later) configured to support the waste toner box **5** is rotated about a rotary shaft **32** (which will be described later), which is a support point, and is tilted so as to be distant from the first wall **20**.

Thereby, in the state where the waste toner box **5** is located at the third position, the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C mounted to the apparatus main body **2** is not located downstream of the waste toner box **5** located at the third position with respect to the separation direction of the waste toner box **5** from the apparatus main body **2**. For this reason, in the state where the waste toner box **5** is located at the third position, the waste toner box **5** can be separated from the apparatus main body **2**.

3.2 Support Configuration of Waste Toner Box

As shown in FIG. **8**, the apparatus main body **2** is configured to support the waste toner box **5** so that the waste toner box **5** can move. Specifically, the apparatus main body **2** further includes a first wall **20**, a second wall **21**, and a first support part **26**.

3.2.1 First Wall

The first wall **20** is formed to divide an internal space of the apparatus main body **2** into a first space in which the plurality of cartridges **4**K, **4**Y, **4**M, **4**C (refer to FIG. **1**) is accommodated and a second space in which the waste toner box **5** and the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C (refer to FIG. **8**) are accommodated. The first wall **20** extends in the vertical direction. The first wall **20** is located between the

plurality of cartridges **4**K, **4**Y, **4**M, **4**C and the waste toner box **5** located at the first position. Specifically, the first wall **20** is located between the plurality of cartridges **4**K, **4**Y, **4**M, **4**C and the box main body **52** of the waste toner box **5** located at the first position, in the axis direction. The first wall **20** has a plurality of first hole **20**A. Each of the plurality of first hole **20**A is formed to face the waste toner coupling wall **71** in the axis direction, in the state where the drawer **3** is located at the inner position. The plurality of first hole **20**A is formed to receive the plurality of coupling parts **50**K, **50**Y, **50**M, **50**C (refer to FIG. **6**), in the state where the waste toner box **5** is located at the first position.

3.2.2 Second Wall

The second wall **21** is located at an opposite side to the plurality of cartridges **4**K, **4**Y, **4**M, **4**C with respect to the waste toner box **5** located at the first position. The second wall **21** is located with being spaced from the first wall **20** in the axis direction. The second wall **21** extends in the vertical direction. The second wall **21** has a second opening **21**A and a movable wall **21**B.

The second opening **21**A is located at an opposite side to the plurality of cartridges **4**K, **4**Y, **4**M, **4**C with respect to the waste toner box **5** located at the first position, in the axis direction.

The movable wall **21**B is configured to be movable in association with movement of the waste toner box **5**. For this reason, it is possible to suppress the second wall **21** from being an obstacle to movement of the waste toner box **5**, so that it is possible to secure smooth movement of the waste toner box **5**. The movable wall **21**B is supported to a lower end of the second opening **21**A of the second wall **21**. The movable wall **21**B can swing about a lower end portion of the movable wall **21**B, which is a support point. The movable wall **21**B extends in the vertical direction, in the state where the waste toner box **5** is located at the first position.

3.2.3 First Accommodation Part

The first support part **26** is configured to support the waste toner box **5**. The first support part **26** is located between the first wall **20** and the second wall **21** in the axis direction. The first support part **26** is supported to the first wall **20**. The first support part **26** has a rotary shaft **32** and a first accommodation frame **31**.

The rotary shaft **32** extends in the alignment direction. The rotary shaft **32** is rotatably supported to the first wall **20**.

The first accommodation frame **31** can accommodate therein the waste toner box **5**. The first accommodation frame **31** has a first side frame **31**A, a second side frame **31**B, a movable frame **31**C, and a mounting/demounting opening **31**D.

The first side frame **31**A is located at one end of the first accommodation frame **31** in the axis direction. The second side frame **31**B is located at the other end of the first accommodation frame **31** in the axis direction. The first side frame **31**A is located at an opposite side to the first wall **20** with respect to the box main body **52**, in the state where the waste toner box **5** is located at the first position. The second side frame **31**B is located between the box main body **52** and the first wall **20** in the state where the waste toner box **5** is located at the first position. Each of the first side frame **31**A and the second side frame **31**B extends in the vertical direction, in the state where the waste toner box **5** is located at the first position.

The movable frame **31**C is configured to be movable in association with movement of the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C. The movable frame **31**C is supported to an upper end of the first side frame **31**A. The movable frame **31**C extends in the vertical direction in a state where the waste toner box **5** is located at the first position and the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C is located at a coupling position. In the meantime, the coupling position will be described later. The movable frame **31**C is configured to be swingable about a lower end portion of the movable frame **31**C, which is a support point. The first side frame **31**A and the movable frame **31**C are configured to close a lower part of the second opening **21**A, in the state where the waste toner box **5** is located at the first position.

The mounting/demounting opening **31**D is formed to allow the waste toner box **5** to pass therethrough when mounting and demounting the waste toner box **5** to and from the first accommodation frame **31**. The mounting/demounting opening **31**D is defined between an upper end of the second side frame **31**B and an upper end of the movable frame **31**C.

The first accommodation frame **31** is mounted to the rotary shaft **32**. Specifically, a lower end portion of the first accommodation frame **31** is fixed to the rotary shaft **32**. Thereby, the waste toner box **5** rotates about the rotary shaft **32** in a state where it is accommodated in the first support part **26**. That is, a rotation support point of the waste toner box **5** is the rotary shaft **32** and is supported to the first wall **20**. For this reason, as compared to a configuration where the rotation support point of the waste toner box **5** is supported to the second wall **21**, it is possible to reduce an amount of movement of the coupling part **50**M in the vertical direction and to make the image forming apparatus **1** smaller in the vertical direction.

As shown in FIG. **9**, when the waste toner box **5** is moved from the first position to the second position, the first accommodation frame **31** is tilted so as to be distant from the first wall **20** about the rotary shaft **32**, which is a support point. In the state where the waste toner box **5** is located at the second position, the plurality of coupling parts **50**K, **50**Y, **50**M, **50**C (refer to FIG. **6**) is located at an opposite side to the discharge part **41** with respect to the first wall **20**. Also, in the state where the waste toner box **5** is located at the second position, the waste toner box **5** cannot be separated from the first accommodation frame **31**. In the state where the waste toner box **5** is located at the second position, the waste toner box **5** overlaps the second support part **27**M in the separation direction from the apparatus main body **2**, specifically, in the extension direction of the first side frame **31**A. In the meantime, the second support part **27**M will be described later.

As shown in FIG. **10**A, when the waste toner box **5** is moved from the second position to the third position, the first accommodation frame **31** is tilted so as to be more distant from the first wall **20** than at the second position about the rotary shaft **32**, which is a support point. In the state where the waste toner box **5** is located at the third position, the waste toner box **5** does not overlap the second support part **27**M in the separation direction from the apparatus main body **2**, specifically, in the extension direction of the first side frame **31**A. Also, the mounting/demounting opening **31**D is exposed from the lower part of the second opening **21**A. For this reason, the waste toner box **5** can be separated from the first accommodation frame **31** through the mounting/demounting opening **31**D and the second opening **21**A.

Also, when the waste toner box **5** is moved from the first position (refer to FIG. **8**) to the second position (refer to FIG. **9**) or to the third position (refer to FIG. **10**A), the first side frame **31**A comes in contact with the movable wall **21**B. For this reason, the movable wall **21**B swings so as to be distant

from the first wall **20** about a lower end of the movable wall **21**B, which is a support point, in association with movement of the first accommodation frame **31**.

3.3 Toner Box

As shown in FIG. **8**, the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C is configured to supply the toner to the plurality of cartridges **4**K, **4**Y, **4**M, **4**C (refer to FIG. **7**). Each of the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C has a housing **91**, an auger **93** (refer to FIG. **11**A), a supply unit (one example of a supply device) **90**, and a shutter **94**. Each of the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C has the same structure. Therefore, the toner box **9**M is described, and the descriptions of the toner boxes **9**K, **9**Y, **9**C are omitted.

3.3.1 Housing and Auger

As shown in FIGS. **11**A and **11**B, the housing **91** is configured to accommodate therein the toner. The housing **91** has a partitioning wall **92** and a communication opening **92**A.

The partitioning wall **92** is configured to partition an internal space of the housing **91** into a first accommodation chamber **91**A and a second accommodation chamber **91**B. The partitioning wall **92** is arranged in the housing **91**. The partitioning wall **92** extends in the axis direction. The first accommodation chamber **91**A is located above the second accommodation chamber **91**B, in a state where the toner box **9**M is located at the coupling position. A first agitator **95** is arranged in the first accommodation chamber **91**A. A second agitator **96** is arranged in the second accommodation chamber **91**B.

The communication opening **92**A is arranged at the partitioning wall **92**. The communication opening **92**A is formed to communicate the first accommodation chamber **91**A and the second accommodation chamber **91**B each other.

The auger **93** is configured to convey the toner in the second accommodation chamber **91**B toward the supply unit **90**. The auger **93** extends in the axis direction.

3.3.2 Supply Unit and Shutter

As shown in FIG. **8**, the supply unit **90** is arranged on an outer surface of the housing **91** in the axis direction. The supply unit **90** has a cylindrical shape. The supply unit **90** extends in the axis direction. The supply unit **90** has one end and the other end in the axis direction. One end of the supply unit **90** is fixed to the housing **91**. The other end of the supply unit **90** is closed. An internal space of the supply unit **90** is formed to communicate with an internal space of the housing **91**. Specifically, the supply unit **90** is configured to communicate with the second accommodation chamber **91**B (refer to FIG. **11**A). For this reason, it is possible to supply the toner accommodated in the housing **91** from the second accommodation chamber **91**B to the supply unit **90**.

The supply unit **90** can be coupled with the receiving part **43** of each of the plurality of cartridges **4**K, **4**Y, **4**M, **4**C (refer to FIG. **7**). The supply unit **90** can supply the toner to the receiving part **43** of each of the plurality of cartridges **4**K, **4**Y, **4**M, **4**C.

The supply unit **90** has a toner passage opening **90**A. The toner passage opening **90**A is formed to allow the toner to pass therethrough. The toner passage opening **90**A is located at a lower end of the supply unit **90** in the state where the toner box **9**M is located at the coupling position.

The shutter **94** is arranged on a peripheral surface of the supply unit **90**. The shutter **94** is configured to be movable between a closing position at which the toner passage opening **90**A is closed and an opening position at which the toner passage opening **90**A is opened.

3.3.3 Coupling Position of Toner Box

Each of the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C is configured to be movable between a coupling position (refer to FIG. **8**) and a decoupling position (refer to FIG. **9**) in a state where the toner box is mounted to the apparatus main body **2**. In the exemplary embodiment, each of the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C is configured to be rotatable among the coupling position (refer to FIG. **8**), the decoupling position (refer to FIG. **9**), and a separable position (refer to FIG. **10**B) in the state where the toner box is mounted to the apparatus main body **2**. For this reason, it is possible to smoothly move each of the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C to the coupling position, the decoupling position and the separable position.

In a state where each of the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C is located at the coupling position, the supply unit **90** of each of the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C is coupled with the receiving part **43** of each of the plurality of cartridges **4**K, **4**Y, **4**M, **4**C (refer to FIG. **7**). Specifically, in a state where the toner box **9**K is located at the coupling position, the supply unit **90** of the toner box **9**K is coupled with the receiving part **43** of the cartridge **4**K. In a state where the toner box **9**Y is located at the coupling position, the supply unit **90** of the toner box **9**Y is coupled with the receiving part **43** of the cartridge **4**Y. In a state where the toner box **9**M is located at the coupling position, the supply unit **90** of the toner box **9**M is coupled with the receiving part **43** of the cartridge **4**M. In a state where the toner box **9**C is located at the coupling position, the supply unit **90** of the toner box **9**C is coupled with the receiving part **43** of the cartridge **4**C. In the meantime, each of the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C is arranged in the same manner at each of the coupling position, the decoupling position and the separable position. Therefore, the toner box **9**M that is located at each of the coupling position, the decoupling position and the separable position is described, and the descriptions of the toner boxes **9**K, **9**Y, **9**C are omitted.

In the state where the toner box **9**M is located at the coupling position, the supply unit **90** is fitted to the toner coupling wall **74**. In a state where each of the shutter **75** and the shutter **94** is located at the opening position, the toner passage opening **90**A of the supply unit **90** and the toner receiving opening **73**A of the toner receiving wall **73** communicate with each other. Thereby, it is possible to supply toner accommodated in the housing **91** from the supply unit **90** to the toner receiving wall **73**.

Also, the first wall **20** is located between the cartridge **4**M and the toner box **9**M located at the coupling position. Specifically, the first wall **20** is located between the cartridge **4**M and the housing **91** of the toner box **9**M located at the coupling position, in the axis direction.

The first wall **20** has a plurality of second holes **20**B. Each of the plurality of second holes **20**B is formed to face the toner coupling wall **74** of the receiving part **43** in the axis direction in the state where the drawer **3** is located at the inner position. The second hole **20**B receives the supply unit **90** in the state where the toner box **9**M is located at the coupling position.

3.3.4 Decoupling Position of Toner Box

As shown in FIG. **9**, in the state where the toner box **9**M is located at the decoupling position, the toner box **9**M is located more distant from the cartridge **4**M than at the first position. In the state where the toner box **9**M is located at the decoupling position, the supply unit **90** and the receiving part **43** are decoupled. Specifically, in the state where the toner box **9**M is located at the decoupling position, the

supply unit **90** is separated from the toner coupling wall **74**. In the state where the toner box **9**M is located at the decoupling position, the supply unit **90** is located at an opposite side to the receiving part **43** with respect to the first wall **20**. For this reason, when the drawer **3** is moved to the inner position and the outer position, it is possible to suppress the supply unit **90** from being an obstacle.

In the meantime, in the state where the toner box **9**M is located at the decoupling position, an upper wall of the apparatus main body **2** is located downstream of the toner box **9**M located at the decoupling position with respect to the separation direction of the toner box **9**M from the apparatus main body **2**. For this reason, the toner box **9**M cannot be separated from the apparatus main body **2** in the state where the toner box **9**M is located at the decoupling position.

3.3.5 Separable Position of Toner Box

As shown in FIG. **10**B, in a state where the toner box **9**M is located at the separable position, the toner box **9**M is located more distant from the coupling position (refer to FIG. **8**) that the decoupling position (refer to FIG. **9**). In the state where the toner box **9**M is located at the separable position, a distance between the supply unit **90** and the receiving part **43** is greater than a distance in the state where the toner box **9**M is located at the decoupling position. Specifically, when the toner box **9**M is moved from the decoupling position to the separable position, a second accommodation frame **33** (which will be described later) configured to support the toner box **9**M rotates about a rotary shaft **34** (which will be described later), which is a support point, and is thus tilted so as to be distant from the first wall **20**.

Thereby, in the state where the toner box **9**M is located at the separable position, the upper wall of the apparatus main body **2** is not located downstream of the toner box **9**M located at the separable position with respect to the separation direction of the toner box **9**M from the apparatus main body **2**. For this reason, the toner box **9**M can be separated from the apparatus main body **2** in the state where the toner box **9**M is located at the separable position.

3.4 Second Support Part

As shown in FIG. **8**, the apparatus main body **2** is configured to support the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C so that each of the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C can move. The apparatus main body **2** further includes a plurality of second support part **27**K (not shown), **27**Y (not shown), **27**M and **27**C (not shown). The plurality of second support part **27**K (not shown), **27**Y (not shown), **27**M and **27**C (not shown) has the same structure. Therefore, in the below, the second support part **27**M is described, and the descriptions of the second support parts **27**K, **27**Y, **27**C are omitted.

The second support part **27**M is configured to support the toner box **9**M. The second support part **27**M is located above the first support part **26**. The second support part **27**M is supported to the first wall **20**. The second support part **27**M has a rotary shaft **34** and a second accommodation frame **33**.

The rotary shaft **34** extends in the alignment direction. The rotary shaft **34** is rotatably supported to the first wall **20**.

The second accommodation frame **33** can accommodate therein the toner box **9**M. The second accommodation frame **33** has a third side frame **33**A, a fourth side frame **33**B, and a mounting/demounting opening **33**C.

The third side frame **33**A is located at one end of the second accommodation frame **33** in the axis direction. The fourth side frame **33**B is located at the other end of the second accommodation frame **33** in the axis direction. The third side frame **33**A is located at an opposite side to the first wall **20** with respect to the housing **91**, in the state where the toner box **9**M is located at the coupling position. The fourth side frame **33**B is located between the housing **91** and the first wall **20** in the state where the toner box **9**M is located at the coupling position. Each of the third side frame **33**A and the fourth side frame **33**B extends in the vertical direction in the state where the toner box **9**M is located at the coupling position. The third side frame **33**A is configured to close an upper part of the second opening **21**A in the state where the toner box **9**M is located at the coupling position.

The mounting/demounting opening **33**C is formed to allow the toner box **9**M to pass therethrough when mounting and demounting the toner box **9**M to and from the second accommodation frame **33**. The mounting/demounting opening **33**C is defined between an upper end of the third side frame **33**A and an upper end of the fourth side frame **33**B.

The second accommodation frame **33** is mounted to the rotary shaft **34**. Specifically, a lower end portion of the second accommodation frame **33** is fixed to the rotary shaft **34**. Thereby, the toner box **9**M rotates about the rotary shaft **34** in the state where it is supported to the second support part **27**M. That is, a rotation support point of the toner box **9**M is the rotary shaft **34** and is supported to the first wall **20**.

As shown in FIG. **9**, when the toner box **9**M is moved from the coupling position (refer to FIG. **8**) to the decoupling position, the second accommodation frame **33** is tilted so as to be distant from the first wall **20** about the rotary shaft **34**, which is a support point. In the state where the toner box **9**M is located at the decoupling position, the toner box **9**M overlaps the upper wall of the apparatus main body **2** in the separation direction from the apparatus main body **2**, specifically, in the extension direction of the third side frame **33**A. For this reason, in the state where the toner box **9**M is located at the decoupling position, the toner box **9**M cannot be separated from the second support part **27**M.

As shown in FIG. **10**B, when the toner box **9**M is moved from the decoupling position (refer to FIG. **9**) to the separable position, the second accommodation frame **33** is tilted so as to be more distant from the first wall **20** than at the decoupling position (refer to FIG. **9**) about the rotary shaft **34**, which is a support point. In the state where the toner box **9**M is located at the separable position, the toner box **9**M does not overlap the upper wall of the apparatus main body **2** in the separation direction from the apparatus main body **2**, specifically, in the extension direction of the third side frame **33**A. Also, the mounting/demounting opening **33**C is exposed from the upper part of the second opening **21**A. For this reason, the toner box **9**M can be separated from the second accommodation frame **33** through the mounting/demounting opening **33**C and the second opening **21**A.

Also, when the waste toner box **5** is located at the first position and the toner box **9**M is moved from the coupling position (refer to FIG. **8**) to the decoupling position (refer to FIG. **9**) or the separable position, the third side frame **33**A comes in contact with the movable frame **31**C. For this reason, the movable frame **31**C swings to be distant from the first wall **20** about a lower end of the movable frame **31**C, which is a support point, in association with movement of the second accommodation frame **33**.

3.5 First Pressing Unit

Also, as shown in FIG. **7**, the image forming apparatus **1** further includes a plurality of first pressing units **28**A, **28**B, a plurality of second pressing units **29**K, **29**Y, **29**M, **29**C, a first link member **7**, a first guide **37**, a second guide **38**, a coupling part **81**, a second link member **8**, and a third guide **39**.

The first pressing units **28**A, **28**B are configured to press the waste toner box **5** so that the waste toner box **5** is to face from the first position toward the second position (refer to FIG. **8**). The first pressing units **28**A, **28**B are located with being spaced from each other in the alignment direction. The first pressing units **28**A, **28**B are arranged in the first guide **37**. The first guide **37** will be described later. Also, the first pressing units **28**A, **28**B have the same structure. Therefore, in the below, the first pressing unit **28**A is described, and the description of the first pressing unit **28**B is omitted.

As shown in FIG. **8**, the first pressing unit **28**A is located at an opposite side to the first accommodation frame **31** with respect to the first wall **20**, in the axis direction. The first pressing unit **28**A is located at an opposite side to the box main body **52** with respect to the second side frame **31**B, in the axis direction. The first pressing unit **28**A is located between the coupling part **50**M and the rotary shaft **32** in the vertical direction in the state where the waste toner box **5** is located at the first position. The first pressing unit **28**A has a spring **23** and a first contact part **35**. That is, the image forming apparatus **1** includes the spring **23**.

The spring **23** is provided to press the waste toner box **5** from the first position toward the second position (refer to FIG. **9**). The spring **23** is located between the coupling part **50**M and the rotary shaft **32**, in the state where the waste toner box **5** is located at the first position. In other words, the spring **23** is located between the coupling part **50**M and the rotation support point of the waste toner box **5** in the vertical direction in the state where the waste toner box **5** is located at the first position. For this reason, it is possible to effectively arrange the spring **23**.

The first contact part **35** is in contact with the second side frame **31**B through a third hole **20**C of the first wall **20**. The first contact part **35** is pressed toward the second side frame **31**B by the spring **23**. The first contact part **35** has a cylindrical shape. The first contact part **35** extends in the axis direction. The first contact part **35** is configured to accommodate therein the spring **23**.

3.6 Second Pressing Unit

As shown in FIG. **7**, the plurality of second pressing units **29**K, **29**Y, **29**M, **29**C is configured to press the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C so that the plurality of toner boxes **9**K, **9**Y, **9**M, **9**C is to face from the coupling position (refer to FIG. **8**) toward the decoupling position (refer to FIG. **9**). The plurality of second pressing units **29**K, **29**Y, **29**M, **29**C is located with being spaced from each other in the alignment direction. The plurality of second pressing units **29**K, **29**Y, **29**M, **29**C is arranged in the second guide **38**. The second guide **38** will be described later. The plurality of second pressing units **29**K, **29**Y, **29**M, **29**C has the same structure. Therefore, in the below, the second pressing unit **29**M is described, and the descriptions of the plurality of second pressing units **29**K, **29**Y, **29**C are omitted.

As shown in FIG. **8**, the second pressing unit **29**M is located at an opposite side to the second accommodation frame **33** with respect to the first wall **20**, in the axis direction. The second pressing unit **29**M is located at an opposite side to the housing **91** with respect to the fourth side frame **33**B, in the axis direction. The second pressing unit **29**M is located between the supply unit **90** and the rotary shaft **34** in the vertical direction, in the state where the toner box **9**M is located at the coupling position. The second pressing unit **29**M has a second spring **25** and a second contact part **36**.

The second spring **25** is provided to press the toner box **9**M from the coupling position toward the decoupling position (refer to FIG. **9**). The second spring **25** is located between the supply unit **90** and the rotation support point of the toner box **9**M, in the state where the toner box **9**M is located at the coupling position.

The second contact part **36** is in contact with the fourth side frame **33**B through a fourth hole **20**D of the first wall **20**. The second contact part **36** is pressed toward the fourth side frame **33**B by the second spring **25**. The second contact part **36** has a cylindrical shape. The second contact part **36** extends in the axis direction. The second contact part **36** is configured to accommodate therein the second spring **25**.

3.7 First Link Member

The first link member **7** is configured to interlink movement of the cover **2**B and pressing and press-releasing of the spring **23** with respect to the waste toner box **5**. The first link member **7** is configured to restrain the pressing of the spring **23** to the waste toner box **5** in a state where the cover **2**B is located at the closing position. The first link member **7** allows the spring **23** to press the waste toner box **5** when the cover **2**B is moved from the closing position to the opening position (refer to FIG. **9**). For this reason, when the cover **2**B is moved from the closing position to the opening position, the waste toner box **5** can be securely located at the second position.

Also, the first link member **7** is configured to interlink movement of the cover **2**B and pressing and press-releasing of the second spring **25** with respect to the toner box **9**M. The first link member **7** is configured to restrain the pressing of the second spring **25** to the toner box **9**M in a state where the cover **2**B is located at the closing position. The first link member **7** allows the second spring **25** to press the toner box **9**M when the cover **2**B is moved from the closing position to the opening position (refer to FIG. **9**).

As shown in FIG. **7**, the first link member **7** has a first part **77**, a second part **78**, a connection part **79**, and a first boss **80**.

3.7.1 First Part

The first part **77** extends in the alignment direction. The first part **77** is located at an opposite side to the first accommodation frame **31** with respect to the first wall **20** in the axis direction (refer to FIG. **8**). The first part **77** is located below the discharge part **41** in the state where the drawer **3** is located at the inner position. The first part **77** has a plurality of first through-openings **82**A, **82**B, and a plurality of first cams **83**A, **83**B (refer to FIG. **13**).

The plurality of first through-openings **82**A, **82**B is located with being spaced from each other in the alignment direction. The plurality of first through-openings **82**A, **82**B has the same structure. Therefore, in the below, the first through-opening **82**A is described, and the description of the first through-opening **82**B is omitted.

The first through-opening **82**A is formed to receive the first contact part **35** of the first pressing unit **28**A. The first through-opening **82**A extends in the alignment direction. The first through-opening **82**A has one end and the other end in the alignment direction. The first contact part **35** is located at one end of the first through-opening **82**A in the state where the cover **2**B is located at the closing position. The first contact part **35** is located at the other end of the first through-opening **82**A in the state where the cover **2**B is located at the opening position (refer to FIG. **12**).

As shown in FIG. **13**, the plurality of first cams **83**A, **83**B is located with being spaced from each other in the alignment direction. The plurality of first cams **83**A, **83**B has the same structure. Therefore, in the below, the first cam **83**A is described, and the description of the first cam **83**B is omitted. The first cam **83**A is located at an opposite side to

the first wall **20** with respect to the first part **77** (refer to FIG. **8**). The first cam **83**A is configured to surround one end of the first through-opening **82**A. The first cam **83**A protrudes from one end edge of the first through-opening **82**A of the first part **77** in the axis direction. The first cam **83**A has an inclined surface S**1**. The inclined surface S**1** is inclined to intersect with the axis direction.

As shown in FIG. **8**, the first cam **83**A is in contact with the first contact part **35** in the state where the cover **2**B is located at the closing position. Thereby, the first contact part **35** separates from the first accommodation frame **31** in the axis direction, against a pressing force of the spring **23**. For this reason, the pressing of the spring **23** to the waste toner box **5** is restrained.

As shown in FIG. **9**, the first cam **83**A is in contactless with the first contact part **35** in the state where the cover **2**B is located at the opening position. Thereby, the first contact part **35** comes in contact with the first accommodation frame **31** by the pressing force of the spring **23**, thereby pressing the first accommodation frame **31**. For this reason, the restraint on the pressing of the spring **23** to the waste toner box **5** is released. Then, the spring **23** presses the waste toner box **5**.

3.7.2 Second Part

As shown in FIG. **7**, the second part **78** extends in the alignment direction. The second part **78** is located at an opposite side to the second accommodation frame **33** with respect to the first wall **20** in the axis direction (refer to FIG. **8**). The second part **78** is located at an opposite side to the first part **77** with respect to the discharge part **41**, in the state where the drawer **3** is located at the inner position. The second part **78** is located between the discharge part **41** and the receiving part **43**, in the state where the drawer **3** is located at the inner position. The second part **78** has a plurality of second through-openings **84**K, **84**Y, **84**M, **84**C, and a plurality of second cams **85**K, **85**Y, **85**M, **85**C (refer to FIG. **13**).

The plurality of second through-openings **84**K, **84**Y, **84**M, **84**C is located with being spaced from each other in the alignment direction. The plurality of second through-openings **84**K, **84**Y, **84**M, **84**C has the same structure. Therefore, in the below, the second through-opening **84**M is described, and the descriptions of the second through-openings **84**K, **84**Y, **84**C are omitted. The second through-opening **84**M is formed to receive the second contact part **36** of the second pressing unit **29**M. The second through-opening **84**M extends in the alignment direction. The second through-opening **84**M has one end and the other end in the alignment direction. The second contact part **36** is located at one end of the second through-opening **84**M in the state where the cover **2**B is located at the closing position. The second contact part **36** is located at the other end of the second through-opening **84**M in the state where the cover **2**B is located at the opening position (refer to FIG. **12**).

As shown in FIG. **13**, the plurality of second cams **85**K, **85**Y, **85**M, **85**C is located at an opposite side to the first wall **20** with respect to the second part **78** (refer to FIG. **8**). The plurality of second cams **85**K, **85**Y, **85**M, **85**C is located with being spaced from each other in the alignment direction. The plurality of second cams **85**K, **85**Y, **85**M, **85**C has the same structure. Therefore, in the below, the second cam **85**M is described, and the descriptions of the second cams **85**K, **85**Y, **85**C are omitted.

The second cam **85**M is configured to surround one end of the second through-opening **84**M. The second cam **85**M protrudes from one end edge of the second through-opening **84**M of the second part **78** in the axis direction. The second cam **85**M has an inclined surface S**2**. The inclined surface S**2** is inclined to intersect with the axis direction.

As shown in FIG. **8**, the second cam **85**M is in contact with the second contact part **36** in the state where the cover **2**B is located at the closing position. Thereby, the second contact part **36** separates from the second accommodation frame **33** in the axis direction, against a pressing force of the second spring **25**. For this reason, the pressing of the second spring **25** to the toner box **9**M is restrained.

As shown in FIG. **9**, the second cam **85**M is in contactless with the second contact part **36** in the state where the cover **2**B is located at the opening position. Thereby, the second contact part **36** comes in contact with the second accommodation frame **33** by the pressing force of the second spring **25**, thereby pressing the second accommodation frame **33**. For this reason, the restraint on the pressing of the second spring **25** to the toner box **9**M is released. Then, the second spring **25** presses the toner box **9**M.

3.7.3 Connection Part and Boss

As shown in FIG. **13**, the connection part **79** is configured to interconnect the first part **77** and the second part **78**. The connection part **79** extends in the vertical direction. The connection part **79** is located with being spaced from the cover **2**B in the alignment direction. The connection part **79** has a receiving hole **86**. The receiving hole **86** is formed to receive a second boss **89** of the second link member **8**. The second boss **89** will be described later.

The first boss **80** extends in the axis direction. The first boss **80** is fixed to the connection part **79**.

3.7.4 Coupling Part

The coupling part **81** is configured to couple the cover **2**B and the first link member **7** each other. The coupling part **81** is arranged in alignment with the connection part **79** in the axis direction. The coupling part **81** has a circular arc shape of which a center is the rotation support point of the cover **2**B. The coupling part **81** is fixed to the cover **2**B. The coupling part **81** has a long hole **87**. The long hole **87** is formed to receive the first boss **80**. The long hole **87** extends in a rotating direction of the cover **2**B. The long hole **87** has one end **87**A and the other end **87**B in an extension direction of the long hole **87**. The other end **87**B of the long hole **87** is located at an opposite side to the cover **2**B with respect to one end **87**A of the long hole **87** in the extension direction of the long hole **87**. The first boss **80** is located at one end **87**A of the long hole **87** in the state where the cover **2**B is located at the closing position. The first boss **80** is located at the other end **87**B of the long hole **87** in the state where the cover **2**B is located at the opening position (refer to FIG. **12**).

3.8 First Guide and Second Guide

As shown in FIG. **7**, the first guide **37** guides the first part **77** when the cover **2**B is moved between the closing position and the opening position. The first guide **37** extends in the alignment direction. The first guide **37** is configured to slidably accommodate the first part **77**. The first guide **37** is fixe to the first wall **20**. The second guide **38** guides the second part **78** when the cover **2**B is moved between the closing position and the opening position. The second guide **38** extends in the alignment direction. The second guide **38** is configured to slidably accommodate the second part **78**. The second guide **38** is located with being spaced upward from the first guide **37**.

3.8 Second Link Member and Third Guide

The second link member **8** is configured to interlink movement of the cover **2**B and movement of the drawer **3**. The drawer **3** is configured to be movable between the contact position (refer to FIG. **1**) and the spaced position (refer to FIG. **12**) in the state where the drawer is located at

the inner position. In the state where the drawer **3** is located at the contact position, the photosensitive drums **40** of the plurality of cartridges **4**K, **4**Y, **4**M, **4**C are in contact with the belt unit **6** (refer to FIG. **1**). In the state where the drawer **3** is located at the spaced position, the photosensitive drums **40** of the plurality of cartridges **4** are spaced from the belt unit **6** (refer to FIG. **12**). In the state where the cover **2**B is located at the closing position, the second link member **8** locates the drawer **3** at the contact position (refer to FIG. **1**). The second link member **8** moves the drawer **3** from the contact position to the spaced position (refer to FIG. **12**) when the cover **2**B is moved from the closing position to the opening position. For this reason, when the cover **2**B is moved from the closing position to the opening position, it is possible to securely space the drawer **3** from the belt unit **6**. As a result, it is possible to secure smooth movement of the drawer **3**.

As shown in FIG. **14**, the second link member **8** is located between the first part **77** and the second part **78** in the vertical direction (refer to FIG. **7**). The second link member **8** has a link main body **88** and a second boss **89**.

3.8.1 Link Main Body **88**

The link main body **88** extends in the alignment direction. The link main body **88** is located at an opposite side to the coupling part **81** with respect to the first link member **7** in the axis direction. The link main body **88** is located below the drawer **3** in the state where the drawer **3** is located at the inner position (refer to FIG. **8**). An upper surface of the link main body **88** is in contact with the drawer **3** in the state where the drawer **3** is located at the inner position (refer to FIG. **8**). A lower surface of the link main body **88** has a first surface **88**A, a second surface **88**B, a third surface **88**C, a fourth surface **88**D, and a fifth surface **88**E.

The first surface **88**A is located at an end portion of the lower surface of the link main body **88** facing toward the cover **2**B. The first surface **88**A extends in the alignment direction. The second surface **88**B is located at an opposite side to the cover **2**B with respect to the first surface **88**A. The second surface **88**B is inclined to intersect with the vertical direction. The second surface **88**B has one end and the other end in the alignment direction. One end of the second surface **88**B continues to the first surface **88**A. The other end of the second surface **88**B is located at a position lower than one end of the second surface **88**B. The other end of the second surface **88**B continues to the third surface **88**C.

The third surface **88**C is located at an opposite side to the cover **2**B with respect to the second surface **88**B. The third surface **88**C extends in the alignment direction. The fourth surface **88**D is located at an opposite side to the cover **2**B with respect to the third surface **88**C. The fourth surface **88**D is inclined to intersect with the vertical direction. The fourth surface **88**D has one end and the other end in the alignment direction. One end of the fourth surface **88**D continues to the third surface **88**C. The other end of the fourth surface **88**D is located at a position lower than one end of the fourth surface **88**D. The other end of the fourth surface **88**D continues to the fifth surface **88**E. The fifth surface **88**E is located at an opposite side to the cover **2**B with respect to the fourth surface **88**D. The fifth surface **88**E extends in the alignment direction.

3.8.2 Second Boss

Also, when the cover **2**B is moved from the closing position to the opening position, the first link member **7** and the second link member **8** are coupled with each other so that the first link member **7** first allows the spring **23** to press the waste toner box **5** and then the second link member **8** moves the drawer **3** from the contact position to the spaced position. For this reason, when the cover **2**B is moved from the closing position to the opening position, the waste toner box **5** is first located at the first position, so that the coupling part **50**M and the discharge part **41** can be decoupled and then the drawer **3** can be moved from the contact position to the spaced position.

Specifically, the second boss **89** is inserted in the receiving hole **86**. Thereby, the second link member **8** is coupled with the first link member **7**. The second boss **89** is fixed to the link main body **88**. The second boss **89** extends in the axis direction.

3.9 Third Guide

When the cover **2**B is moved between the closing position and the opening position, the third guide **39** guides the second link member **8**. The third guide **39** is located below the second link member **8**.

The third guide **39** extends in the alignment direction. The third guide **39** is fixed to the apparatus main body **2**. An upper surface of the third guide **39** is in contact with a lower surface of the link main body **88**. The upper surface of the third guide **39** has a first guide surface **39**A, a second guide surface **39**B, a third guide surface **39**C, a fourth guide surface **39**D, and a fifth guide surface **39**E.

The first guide surface **39**A is located at an end portion of the upper surface of the third guide **39** facing toward the cover **2**B. The first guide surface **39**A extends in the alignment direction. The first guide surface **39**A is in contact with the first surface **88**A in the state where the cover **2**B is located at the closing position. The first guide surface **39**A is in contact with the third surface **88**C in the state where the cover **2**B is located at the opening position (refer to FIG. **12**).

The second guide surface **39**B is located at an opposite side to the cover **2**B with respect to the first guide surface **39**A. The second guide surface **39**B is inclined to intersect with the vertical direction. The second guide surface **39**B has one end and the other end in the alignment direction. One end of the second guide surface **39**B continues to the first guide surface **39**A. The other end of the second guide surface **39**B is located at a position lower than one end of the second guide surface **39**B. The other end of the second guide surface **39**B continues to the third guide surface **39**C. The second guide surface **39**B faces the second surface **88**B in the alignment direction, in the state where the cover **2**B is located at the closing position. The second guide surface **39**B comes in contact with the second surface **88**B when the cover **2**B is moved between the closing position and the opening position.

The third guide surface **39**C is located at an opposite side to the cover **2**B with respect to the second guide surface **39**B. The third guide surface **39**C extends in the alignment direction. The third guide surface **39**C is in contact with the third surface **88**C in the state where the cover **2**B is located at the closing position. The third guide surface **39**C is in contact with the fifth surface **88**E in the state where the cover **2**B is located at the opening position (refer to FIG. **12**).

The fourth guide surface **39**D is located at an opposite side to the cover **2**B with respect to the third guide surface **39**C. The fourth guide surface **39**D is inclined to intersect with the vertical direction. The fourth guide surface **39**D has one end and the other end in the alignment direction. One end of the fourth guide surface **39**D continues to the third guide surface **39**C. The other end of the fourth guide surface **39**D is located at a position lower than one end of the fourth guide surface **39**D. The other end of the fourth guide surface **39**D continues to the fifth guide surface **39**E. The fourth guide surface **39**D faces the fourth surface **88**D in the alignment direction, in the state where the cover **2**B is

located at the closing position. The fourth guide surface **39**D comes in contact with the fourth surface **88**D when the cover **2**B is moved between the closing position and the opening position.

The fifth guide surface **39**E is located at an opposite side to the cover **2**B with respect to the fourth guide surface **39**D. The fifth guide surface **39**E extends in the alignment direction. The fifth guide surface **39**E is in contact with the fifth surface **88**E in the state where the cover **2**B is located at the closing position.

4. Operations of Waste Toner Box, Toner Box and Drawer

Subsequently, operations of the waste toner box **5**, the toner box **9**M and the drawer **3** are described with reference to FIGS. **2**, **9** to **10**B and **12**.

As shown in FIG. **12**, when the cover **2**B is moved from the closing position to the opening position, the other end **87**B of the long hole **87** comes in contact with the first boss **80**. Then, the first link member **7** is moved toward the opening **2**A in the alignment direction, and the second link member **8** is moved toward the opening **2**A in the alignment direction.

Then, as shown in FIG. **9**, the contact between the first contact part **35** and the first cam **83**A is first released by the movement of the first link member **7**. Then, the first contact part **35** is brought into contact with the first accommodation frame **31** by the pressing force of the spring **23**, thereby pressing the first accommodation frame **31**. That is, the first link member **7** allows the spring **23** to press the waste toner box **5**. Thereby, the waste toner box **5** is moved from the first position to the second position.

At this time, the contact between the second contact part **36** and the second cam **85**M is released by the movement of the first link member **7**. Then, the second contact part **36** is brought into contact with the second accommodation frame **33** by the pressing force of the second spring **25**, thereby pressing the second accommodation frame **33**. Thereby, the toner box **9**M is moved from the coupling position to the decoupling position.

Then, as shown in FIG. **12**, the third surface **88**C is brought into contact with the first guide surface **39**A and the fifth surface **88**E is brought into contact with the third guide surface **39**C by the movement of the second link member **8**. Thereby, the second link member **8** is moved upward, and the drawer **3** is moved from the contact position to the spaced position.

Thereafter, as shown in FIG. **2**, when the drawer **3** supporting the plurality of cartridges **4**K, **4**Y, **4**M, **4**C is moved from the inner position to the outer position, a user can mount and demount the plurality of cartridges **4**K, **4**Y, **4**M, **4**C to and from the drawer **3**.

Also, as shown in FIG. **10**A, in order to separate the waste toner box **5** from the apparatus main body **2**, the user rotates the first accommodation frame **31** to locate the waste toner box **5** at the third position. Thereby, the user can mount and demount the waste toner box **5** to and from the first accommodation frame **31**. In the meantime, in the state where the waste toner box **5** is located at the third position, the toner box **9**M may be located at the coupling position or the decoupling position.

Also, as shown in FIG. **10**B, in order to separate the toner box **9**M from the apparatus main body **2**, the user rotates the second accommodation frame **33** to locate the toner box **9**M at the separable position. Thereby, the user can mount and demount the toner box **9**M to and from the second accommodation frame **33**. In the meantime, in the state where the toner box **9**M is located at the separable position, the waste toner box **5** may be located at the first position or the second position.

5. Advantages

As shown in FIG. **8**, in the state where the waste toner box **5** is located at the first position, the plurality of coupling parts **50**K, **50**Y, **50**M, **50**C can receive the waste toner from the plurality of discharge parts **41** (refer to FIG. **7**).

For this reason, the drawer **3** can accommodate the waste toner from the plurality of photosensitive drum **40** into the waste toner box **5** without a member configured to collect the waste toner from the plurality of discharge parts **41** and to convey the same into the waste toner box **5**.

Also, as shown in FIG. **9**, in the state where the waste toner box **5** is located at the second position, the plurality of coupling parts **50**K, **50**Y, **50**M, **50**C and the plurality of discharge parts **41** are decoupled (refer to FIG. **7**). As a result, it is possible to secure the smooth movement of the drawer **3** while accommodating the waste toner from the plurality of photosensitive drums **40** into the waste toner box **5**.

What is claimed is:

1. An image forming apparatus comprising:

an apparatus main body having an opening;

a drawer movable between:

an inner position where the drawer is located inside the apparatus main body; and

an outer position where the drawer is located outside the apparatus main body through the opening;

a first cartridge supported by the drawer, the first cartridge comprising:

a first photosensitive drum; and

a first discharge part configured to discharge waste toner removed from the first photosensitive drum;

a second cartridge supported by the drawer, the second cartridge comprising:

a second photosensitive drum; and

a second discharge part configured to discharge waste toner removed from the second photosensitive drum; and

a waste toner box comprising:

a first coupling part configured to be coupled with the first discharge part; and

a second coupling part configured to be coupled with the second discharge part,

in a state where the first cartridge and the second cartridge are supported by the drawer located at the inner position and the waste toner box is mounted to the apparatus main body, the waste toner box being movable among:

a first position where the first coupling part and the first discharge part are coupled and the second coupling part and the second discharge part are coupled;

a second position where the first coupling part and the first discharge part are decoupled and the second coupling part and the second discharge part are decoupled; and

a third position in a state where the waste toner box is mounted to the apparatus main body;

wherein a distance between the first coupling part and the first discharge part where the waste toner box is located

at the third position is greater than said distance where the waste toner box is located at the second position, and

wherein the waste toner box is separatable from the apparatus main body in a case the waste toner box is located at the third position.

2. The image forming apparatus according to claim **1**, wherein the waste toner box is rotatable between the first position and the second position.

3. The image forming apparatus according to claim **1**, wherein the waste toner box is rotatable among the first position, the second position, and the third position.

4. The image forming apparatus according to claim **1**,

wherein the apparatus main body comprises a second wall that is located across the waste toner box located at the first position from the first cartridge, and

wherein the second wall comprises a movable wall that is movable in association with movement of the waste toner box.

5. The image forming apparatus according to claim **1**, further comprising:

a spring configured to press the waste toner box from the first position to the second position.

6. The image forming apparatus according to claim **5**, further comprising:

a cover movable between a closing position and an opening position, the opening being closed in a case the cover is located at the closing position, and the opening being opened in a case the cover is located at the opening position, and

a first link member configured to:

link movement of the cover and pressing of the waste toner box by the spring and releasing of the pressing by the spring;

restrain pressing of the waste toner box by the spring in a state where the cover is located at the closing position; and

allow the spring to press the waste toner box in accordance with movement of the cover from the closing position to the opening position.

7. The image forming apparatus according to claim **6**, further comprising:

a belt device configured to face the first photosensitive drum and the second photosensitive drum in a state where the drawer is located at the inner position,

the drawer being movable between a contact position and a spaced position in the state where the drawer is located at the inner position,

the first photosensitive drum and the second photosensitive drum being in contact with the belt device in the state where the drawer is located at the contact position, and

the first photosensitive drum and the second photosensitive drum being separated from the belt device in the state where the drawer is located at the spaced position, and

a second link member configured to:

link the movement of the cover and movement of the drawer;

locate the drawer at the contact position in a state where the cover is located at the closing position; and

move the drawer from the contact position to the spaced position in accordance with the movement of the cover from the closing position to the opening position.

8. The image forming apparatus according to claim **7**, wherein in a case the cover is moved from the closing position to the opening position, the first link member first allows the spring to press the waste toner box and then the second link member moves the drawer from the contact position to the spaced position, so that the first link member and the second link member are coupled with each other.

9. The image forming apparatus according to claim **1**,

wherein the first discharge part comprises a discharge wall having a discharge opening, the waste toner passing through the discharge opening, and

wherein the first coupling part comprises a receiving wall configured to face the discharge wall in the state where the waste toner box is located at the first position, the receiving wall having a receiving opening receiving the waste toner from the discharge opening.

10. The image forming apparatus according to claim **9**, further comprising:

an elastic member having a communication opening,

wherein in the state where the waste toner box is located at the first position, the elastic member being disposed between the discharge wall and the receiving wall, and the communication opening being configured to communicate with each of the discharge opening and the receiving opening.

11. The image forming apparatus according to claim **9**,

wherein the receiving wall comprises:

a first end portion; and

a second end portion located across the first end portion from the first cartridge in a direction facing from the waste toner box toward the first cartridge in the state where the waste toner box is located at the first position, and

wherein the receiving wall is inclined so as to be distant from the discharge wall from the second end portion toward the first end portion in the state where the waste toner box is located at the first position.

12. The image forming apparatus according to claim **1**, further comprising:

a first toner box configured to supply toner to the first cartridge,

wherein the first cartridge further comprises a receiving part configured to receive the toner from the first toner box, and

wherein the first toner box comprises a supply device configured to supply the toner to the receiving part and to be coupled with the receiving part, and

wherein in a state where the first toner box is mounted to the apparatus main body, the first toner box is movable between a coupling position and a decoupling position, the supply device and the receiving part being coupled with each other in a state where the first toner box is located at the first position, the supply device and the receiving part being decoupled in a state where the first toner box is located at the decoupling position.

13. The image forming apparatus according to claim **12**, wherein the first toner box is rotatable between the coupling position and the decoupling position.

14. The image forming apparatus according to claim **12**,

wherein the first toner box comprises a housing configured to accommodate the toner, the housing comprising:

a partitioning wall configured to partition an internal space of the housing into a first accommodation chamber and a second accommodation chamber; and

a communication opening disposed at the partitioning wall and configured to communicate the first accommodation chamber and the second accommodation chamber each other, and

wherein the supply device is configured to communicate with the second accommodation chamber.

15. The image forming apparatus according to claim **1**, wherein the first cartridge comprises:

a developing device comprising a developing roller, the developing device being disposed so that the developing roller faces the first photosensitive drum;

a frame configured to rotatably support the first photosensitive drum and to swingably support the developing device; and

an elastic member disposed between the developing device and the frame.

16. The image forming apparatus according to claim **1**, wherein in the state where the waste toner box is located at the first position, the waste toner box is configured to be arranged in alignment with the first cartridge and the second cartridge in an axis direction of a rotational axis of the first photosensitive drum.

17. An image forming apparatus comprising:

an apparatus main body having an opening;

a drawer movable between:

an inner position where the drawer is located inside the apparatus main body; and

an outer position where the drawer is located outside the apparatus main body through the opening;

a first cartridge supported by the drawer, the first cartridge comprising:

a first photosensitive drum; and

a first discharge part configured to discharge waste toner removed from the first photosensitive drum;

a second cartridge supported by the drawer, the second cartridge comprising:

a second photosensitive drum; and

a second discharge part configured to discharge waste toner removed from the second photosensitive drum; and

a waste toner box comprising:

a first coupling part configured to be coupled with the first discharge part; and

a second coupling part configured to be coupled with the second discharge part,

in a state where the first cartridge and the second cartridge are supported by the drawer located at the inner position and the waste toner box is mounted to the apparatus main body, the waste toner box being movable between:

a first position where the first coupling part and the first discharge part are coupled and the second coupling part and the second discharge part are coupled; and

a second position where the first coupling part and the first discharge part are decoupled and the second coupling part and the second discharge part are decoupled;

wherein the apparatus main body comprises:

a first wall located between: the first and second cartridges, and the waste toner box located at the first position; and

a rotary shaft,

wherein the waste toner box is rotatable about the rotary shaft between the first position and the second position, and

wherein the rotary shaft is supported to the first wall.

18. The image forming apparatus according to claim **17**, further comprising:

a spring configured to press the waste toner box from the first position to the second position,

wherein the spring is located between the first coupling part and the rotary shaft in the state where the waste toner box is located at the first position.

19. An image forming apparatus comprising:

an apparatus main body having an opening;

a drawer movable in a first direction between:

an inner position where the drawer is located inside the apparatus main body; and

an outer position where the drawer is located outside the apparatus main body through the opening;

a first cartridge supported by the drawer, the first cartridge comprising:

a first photosensitive drum; and

a first discharge part configured to discharge waste toner removed from the first photosensitive drum;

a second cartridge supported by the drawer, the second cartridge comprising:

a second photosensitive drum; and

a second discharge part configured to discharge waste toner removed from the second photosensitive drum; and

a waste toner box comprising:

a first coupling part configured to be coupled with the first discharge part; and

a second coupling part configured to be coupled with the second discharge part,

in a state where the first cartridge and the second cartridge are supported by the drawer located at the inner position and the waste toner box is mounted to the apparatus main body, the waste toner box being movable in a second direction between:

a first position where the first coupling part and the first discharge part are coupled and the second coupling part and the second discharge part are coupled; and

a second position where the first coupling part and the first discharge part are decoupled and the second coupling part and the second discharge part are decoupled;

wherein the first direction and the second direction are not parallel to each other.

20. An image forming apparatus comprising:

an apparatus main body comprising

a front wall having a first opening; and

a side wall having a second opening;

a drawer movable between:

an inner position where the drawer is located inside the apparatus main body; and

an outer position where the drawer is located outside the apparatus main body through the first opening;

a first cartridge supported by the drawer, the first cartridge comprising:

a first photosensitive drum; and

a first discharge part configured to discharge waste toner removed from the first photosensitive drum;

a second cartridge supported by the drawer, the second cartridge comprising:

a second photosensitive drum; and

a second discharge part configured to discharge waste toner removed from the second photosensitive drum; and

a waste toner box comprising:

a first coupling part configured to be coupled with the first discharge part; and

a second coupling part configured to be coupled with the second discharge part,

in a state where the first cartridge and the second cartridge are supported by the drawer located at the inner position and the waste toner box is mounted to the apparatus main body, the waste toner box being movable between:

a first position where the first coupling part and the first discharge part are coupled and the second coupling part and the second discharge part are coupled; and

a second position where the first coupling part and the first discharge part are decoupled and the second coupling part and the second discharge part are decoupled through the second opening.

* * * * *